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WHAT DOES THE LITERATURE SAY ABOUT THE NEEDS OF VETERANS IN THE AREAS OF HEALTH?

Introduction

As of 1st February 2016 the trained and untrained strength of the UK Regular Forces (which excludes Gurkhas) was 150,950, of which 137,790 were trained personnel. The majority of trained UK Regular Forces personnel are in the Army followed by the RAF and the RN/RM. (MoD, March 2016). There continues to be a stream of Service personnel who will become veterans due to being medically discharged through being wounded, injured or sick (WIS) or through redundancy and time served discharge. Some of those discharged due to WIS may face life changing circumstances and may also be physically and psychologically disabled. Spending time away from family and friends means that Service personnel men and women have to live with constant uncertainty, threats and the possible long term consequences to personal health. In Lord Ashcroft's report (2012) nine out of ten members of the public thought it common for men and women leaving the armed forces to have some kind of physical, emotional or mental health problem. It is likely that this belief has occurred through reporting in the press and misperceptions of the resilience of Service personnel. Without doubt a percentage of those returning from deployment will have on-going health and social care problems. For example Ramasamy et al (2008) highlight that improvised explosive devices (IEDs') account for 70% of mobility issues due to disability through loss of limb. However many conditions leading to medical discharge and associated health and social care problems as a veteran are also equal to or less than the general population (Burgmen and Miller, 2000). The recent conflicts within Iraq and Afghanistan have reintroduced the cyclical need to explore the issues and subsequent discourse relating to British veterans. Therefore this review considered qualitative, quantitative and randomised control trials as they provided an inclusive approach as advocated within systematic reviews (Brown and Sutton, 2010).

Leaving service and making the transition to civilian life can bring many challenges for the veteran and their family and while the majority make this transition successfully a small percentage may struggle. The Ministry of Defence (MOD) have therefore become proactive in helping to meet these challenges and currently focus on health, housing, education, employment and welfare. The focus of this paper is to gather evidence from reliable resources to dispel existing myths that may be held in relation to health issues and as such time experienced within service is reviewed as this has impact on the health of military veterans (Royal British Legion, 2013).

Scope

The UK Government define a veteran as everyone who has undertaken at least one day of military service and received a minimum of a day's pay (MoD, 2011). Yet for many, a veteran is visualised as the older man or woman who were apart of previous great wars. It is fair to say that the term veteran does not have a universal definition but that the term does hold certain perceptions and also provides certain benefits in civilian life (Burdett et al, 2012). Young service men and women who leave the forces and do not refer to themselves as veterans may be placing themselves at a disadvantage. It was clear that this systematic review undertaken in 2013 needed to

consider other terms such as 'armed forces' and 'military' in order to be inclusive of the appropriate research papers and be flexible in approach when searching and selecting studies. Initially searches were made over the last 25 years to encompass key military activity in this time. However the sheer volume of data obtained within that time frame would have been impractical to manage and the last 10 years (2003 – 2013) were considered adequate. Papers were also initially restricted to those written in English and filtered to those that were UK only.

Methods

Scoping searches were initially performed in order to identify relevant search terms and key words. This was followed by comprehensive searches of the following databases CINAHL, MEDLINE, PsychINFO, MENTAL HEALTH ABSTRACTS, Cochrane Database of Systematic Review

Janet (the inter-university library services) Soc Index, and ASSIA. These were selected because they cover a range of perspectives in relation to the topic areas and were therefore likely to produce a comprehensive set of data. A variety of subject headings were combined for each area. For example when searching for the health element the search combined armed forces/veteran with the following; mental health, post-traumatic stress disorder, alcoholism, hearing loss, substance misuse, melanoma, physiotherapy and rehabilitation. The search, initially taking the last 25 years into consideration, located 32,139 papers hence a decision was made to consider only the last 10 years as outlined above. This brought the quantity to 18,638 studies. The studies were then filtered considering the inclusion criteria in Table 1. Studies were **excluded from the review** if they met one of the criteria highlighted in Table 2.

This helped to refine the search to 1, 538 articles for potential inclusion in the study. These papers were further filtered for their strength and relevance. The titles and abstract of all the references were scanned to determine their relevance for the review and full papers were obtained for those deemed relevant. These papers were checked against the inclusion criteria and those meeting the criteria were critically appraised with 28 articles selected for inclusion a summary of which can be found in Table 3.

THE REVIEW (VETERANS AND HEALTH)

The initial research question asked in relation to health was '*What research evidence is available regarding the health and wellbeing of armed forces veterans and their families?*'

It would not be surprising to find that the majority of initial search demonstrated that much of the literature in health was linked to papers outside of the UK and predominantly within the United States of America. However rich data was obtained from the search and was able to be categorised into the following themes; mental health (including PTSD and Suicide); alcohol misuse; anti-social behaviour; amputation; acquired brain injury; hearing loss; cancer; and obesity.

Mental Health

The majority of the identified articles related to mental health issues within which there existed a range of considerations. These papers ranged from the mental health of early service leavers (ESLs) through to the follow up of those who had undertaken several tours of duty and faced combat situations. Additionally some of the studies about to be discussed highlighted the significance of unit cohesion and good leadership on mental health outcomes.

Early service leavers (ESL's) are considered to be one of the most vulnerable groups to leave service. Buckman et al (2012) highlight the concern that ESL's have poorer mental health outcomes than non ESL's. This led to their study considering data on ex serving UK armed forces personnel comparing ESL's who left service before completing their 3 - 4.5 years minimum service with non ESL's. Of the 845 service leavers, 80 (9.5%) were ESL's. Being an ESL was associated with younger age, being female and not being in a relationship. It was also associated with lower rank, serving in the Army and there was a trend in the reporting of higher levels of childhood problems. However the study demonstrated that being an ESL was not linked to deployment, which at the time was to Iraq. Buckman et al concluded that operational service is not a factor for in Service personnel leaving service early however mental health problems were more commonly reported among ESL's in comparison to other service leavers and that there may be a need to target ESL's on leaving service to make their transition smoother. In support of this Finnegan et al (2013) conducted an in depth study relating to the presentation of depression in the British Army. The study which had a two phased approach followed a previous study by Finnegan et al (2010) that concluded "Nearly half of young, junior rank, male soldiers (N=101) who accessed the Army Mental Health Services reported that their primary stressor was a desire to leave the Army. The conclusion from the 2014 study by Finnegan et al was that in the first instance depression in the Army is different than that in civilian life and should be termed 'military depression'. This term is particularly pertinent to young soldiers who wish to leave service but are tied in by terms and conditions.

The long term consequence of deployment on mental health has also created much debate with previous reference being made to the 'Gulf War syndrome' from the first combat situation there in 1993 (Cohn, et al, 2008). Redeployment to Iraq in 2003 rekindled a concern. Harvey et al (2012) conducted a cohort study of 552 UK reservists who deployed to Iraq in 2003 and 391 non deployed reservists. Data on mental health and social functioning were collected at 16 months and 4.8 year period from return of deployment. At the initial 16 month follow up those who had deployed suffered increased common mental health problems, Post Traumatic Stress Disorder (PTSD) and their general health was poor. At 4.8 years those deployed were no longer at risk of common mental disorders and they had good general health and good social functioning. They were however at double the risk of PTSD and were likely to have relationship problems. The study concluded that in the main mental health and social problems following deployment are transient except for reservists who remain at an increased risk of PTSD and relationship problems five years after

their deployment.

Operationally attributable Post traumatic Stress Disorder (PTSD) is a signature mental health condition aligned to military service and therefore veterans, and a clearer understanding of its occurrence is needed. Jones et al (2012) put forward the point that previous studies have not found a significant link between deployment of UK armed forces to Iraq or Afghanistan and the increased risk of PTSD. Jones et al examined a sample of 8261 regular UK armed forces personnel who deployed to Iraq, Afghanistan, other operational areas or were not deployed. Their findings revealed that deployment per se was unrelated to PTSD but holding a combat role was a factor. Additionally experience of childhood adversity, having left service or suffered a serious accident was associated to PTSD. Rank did have some significance in that the higher the rank held the less likely the person was to suffer PTSD. Having confidence in family also appears to have significance on mental health while on deployment. Mulligan et al (2010) conducted a survey with 2042 British forces personnel while they were serving in Iraq and Afghanistan, assessing the prevalence of common mental disorders and PTSD. The prevalence of common mental disorders was 17.8 % and 2.8% for PTSD. Mental health was strongly linked to perceived problems happening at home, thinking about things in a negative way with the more negative the thoughts the stronger the mental health problems. This could be partially reduced if there was good unit cohesion, however perceived poor support for the family had a detrimental impact on the mental health of those deployed. The importance and significance of 'good leadership' should not be underestimated in being a modifying feature for mental illness within military personnel. Jones et al (2012) study found that while combat exposure was associated with PTSD and common mental disorders, it was also reported that strong unit cohesion, high morale and good leadership were all linked to lower levels of common mental health disorder and PTSD. This is further supported by Du Preez et al (2012) who in their study of 4901 male UK armed forces personnel found that unit cohesion and perceived 'good' leadership were of great importance with less PTSD and common mental health disorders. Among regular personnel comradeship was associated with greater alcohol misuse whereas feeling able to talk about personal problems was linked to less alcohol misuse for reservists. Of equal interest is the perceived difference in response by gender to combat situations, Woodhead et al (2012) found that although gender differences in mental health exist, the impact of deployment in mental health is similar among men and women. An additional area for consideration is that in relation to the use of social media. Hatch et al (2013) concluded from their study that service leavers had reduced social participation and an overall disengagement with military social networks when compared to serving personnel. However service leavers were more likely to report common mental disorders and symptoms of PTSD and the former was partially accounted for by the reduction in social integration. Where members are still in service and engaging in social networks there is an association with alcohol misuse for both groups.

Often the onset of PTSD is considered to be delayed and Goodwin et al (2012) examined the prevalence of delayed onset PTSD in 1397 participants. Delayed onset is defined as at least 6 months after a traumatic event. Of the participants 3.5% met the criteria for delayed onset PTSD. Several factors were considered to be associated with delayed onset PTSD including presenting with sub threshold PTSD, having a common mental disorder, poor physical health, multiple symptoms and the

onset of alcohol misuse or common mental disorder. The study concluded that delayed onset PTSD existed in their UK sample and that military personnel were more likely to have delayed onset if they had earlier experienced poor psychological health including alcohol misuse.

A recent concern brought to the attention of the general public by the MOD (2012) is the study of deaths among UK armed forces personnel deployed to the Falklands Campaign. This report explores causes of death which include 95 of the 1,335 deaths occurring in Falkland veterans since 1982 to be attributable to suicide or being given an open verdict (Holmes et al 2013). The Murrison report 'Fighting Fit' (2010) provides specific guidance on how the mental health of veterans should be closely monitored. The report puts forward the point that suicide rates among serving personnel are lower than that of the UK general population however the report also highlight 1,857 veterans have 'been lost to follow up'. The fact that these suicide statistics are lower than the general population should not lead to complacency and assumptions that those affected would have committed suicide anyway. It is known that poor mental health is more profound in younger service men with poor family backgrounds, relationship issues and who have been in direct combat and it is essential that mental health of veterans be given a high priority (Mulligan et al, 2010; Buckman et al, 2012).

The use of Alcohol

Alcohol misuse is identified as a contributing factor in both common mental health and PTSD and indeed it is frequently referred to as contributory factor in bullying, violence and suicide. Fear et al (2007) conducted a large scale study with UK armed forces men and women which involved a random selection of 7937 men and 749 women and was undertaken by a postal questionnaire. Comparisons were made with the general population and measurement was undertaken using the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT tool comprises of ten questions which relate to alcohol consumption, each question with a possible score of 0 – 4. Using this tool a score of 8 or above is usually considered as 'hazardous drinking' however due to high levels of alcohol consumption in the UK military a score of 16 plus has been used to measure drinking patterns (Fear et al, 2007). The study concluded that excessive alcohol consumption is more common in the UK armed forces than in the general population and that there are certain socio demographic associations such as young age; being single; being a smoker and that in service holding a lower rank, not having children, being deployed and being in combat or having a parent with an alcohol or addictive problem were linked. One further study by Browne et al (2008) also considered the significance between alcohol use and deployment to Iraq in 2003. Using the AUDIT tool 3578 randomly selected UK service men deployed during operation TELIC 1, the UK's contribution to the overall coalition effort to remove Saddam Hussein's Ba'athist regime in Iraq in 2003, participated and completed the questionnaire between 2004 and 2006 (after deployment). The study concluded that after initial adjustment to socio demographic and military factors, heavy drinkers (i.e. 16 unit or above on the AUDIT tool) were more likely to have had major home problems both during and following their deployment. In addition being deployed with the parent unit, unit comradeship and poor unit leadership were also linked to heavy drinking.

There is a significant concern over antisocial behaviour which is also frequently linked to alcohol misuse. MacManus et al (2011) identified the need to research the impact of pre-enlistment antisocial behaviour on behaviour among UK military personnel. The sample was a large cohort (10,272) UK military personnel who were currently serving in the 2003 Iraq war. They were randomly selected and all completed a self-reporting questionnaire. Results suggest that those who were already displaying anti-social behaviour before joining the services were more likely to continue this sort of behaviour. Pre enlistment anti-social behaviour was found to be linked to misuse of alcohol, engaging in risk taking behaviour such as driving erratically, not wearing a seat belt and an increased occurrence of not being able to control anger and being involved in violent behaviour. Further study by MacManus et al (2012) considered violent behaviour in UK military personnel returning home after deployment with the aim of establishing how frequent violence occurred after homecoming and to consider the impact of deployment related experiences. The 4928 regular personnel who had been deployed to Iraq were randomly selected and data was collected by questionnaire. Results were that 12.6% had frequency of violence which was linked to pre enlistment anti-social behaviour but was also linked to holding a combat role and experiencing several episodes of trauma. Additionally there was a link to alcohol misuse, PTSD and common mental disorders.

Trauma

Amputation in any context is both life threatening and life changing. The signature serious injury patterns of the Afghanistan conflict was poly-trauma, with orthopaedic problems including amputations (Jansen et al., 2012). The exemplary Bastion Hospital healthcare provision (Care Quality Commission, 2012) combined with increasing effectiveness of clinical interventions and superior body armour resulted in more casualties surviving (Hodgetts, 2012). The Murrison report (2011) recommended a number of new specialist services for prosthetic and rehabilitation which are now being established across England. The impact on loss of limb(s) on mental health, PTSD and family relationships was carried out by Benfield et al (2012) who considered the initial predictors associated with outcome in injured multiple traumatic limb amputation. The study was a retrospective analysis of initial management for improvised explosive device blast traumas that presented with bilateral, traumatic lower extremity amputations with or without pelvic and perinea involvement. In order to evaluate the care of this injury pattern a database of traumatic injury presenting to a North Atlantic Treaty Organisation (NATO) combat hospital in Afghanistan over a seven month period was created. In this period of time thirty two soldiers presented with double lower extremity amputation and nine with triple amputations. Twenty patients met the inclusion criteria for the study and the mean age was 29 years. Patients underwent around 1.6 operations and received life sustaining treatment. The study concluded from a 30 day follow up that IED injuries are survivable injuries and that long term follow up is needed to assess the extent of functional recovery and overall morbidity and mortality.

Due to the severity of trauma it is relevant to determine what the long term consequences are for this group of veterans. Dharma-Datta et al (2011) undertook their study into UK military combat amputees who were assessed at 2.4 years after injury and graded by a Functional Activity Assessment (FAA) which ranged from one

to five with one being fully fit and five unfit for all duties. The study considered 52 amputees, 8 had left the forces due to medical discharge while 44 continued to serve. Of those 44, 33 had returned to work. None of the patients had a FAA of one, eight were graded as a two and eighteen as a three, with nineteen as a grade four and five as a grade five. Multiple amputee patients had significantly higher FAA grades. The study concluded that the majority of soldiers who are amputees are able to return to military work successfully and that physical competence increases significantly with rehabilitation. By this state the initial mental health component of assessment was similar to the normal population.

A frequently reported trauma received while serving is that of acquired brain injury (ABI) which may be caused by a variety of traumatic exposures such as blasts, shrapnel and road traffic accidents. Rona et al (2012) puts forward the point that mild traumatic brain injury is viewed as a further 'signature injury' of the Iraq and Afghanistan war. Of particular importance was a concern that the length of deployment was important and Rona et al (2012) assessed the differences in rates of deployment in 3763 UK personnel who completed a questionnaire between 2007 and 2009. The results demonstrated that in those serving in the Army and Royal Marines there was an association between length of deployment and the incidence of mild traumatic brain injury.

Hearing Loss

Hearing loss remains a health risk for military staff and has been estimated to be the most prevalent industrial disease (Nnaemek, 2007). Nnaemek studied British infantry soldiers knowledge of hearing conservation and looked at various factors that influence their behavior. Noise sources in the military environment range from the use of small fire arms to the use of antiarmor weapons that reach a peak pressure of between 145 -200 decibels, in excess of the known 90 decibels when damage can occur. Certain levels of exposure also put them at greater risk for example being in noisy armoured tanks and not wearing ear defenders. Noise induced hearing loss is likely to be a common problem and the British army established an Army Hearing Conservation Programme. The study by Nnaemek considered an infantry regiment and interviewed twenty three male soldiers between the ages of 18 and 43 years who had served for between 1 and 20 years of service. The results which were themed by content analysis highlighted that only 6 of those interviewed were familiar with the term Conservation Programme but all were aware of the measure that needed to be taken to prevent hearing loss.

Thirteen of the respondents felt it was easy for hearing to become damaged if there was prolonged exposure to loud noise and that included loud music. It is interesting to note that only 6 of the respondents knew that the army had a Hearing Conservation Programme but all were aware that preventing hearing loss was important. Of particular interest was that twenty-one of the respondents stated that the actions that they had taken to protect their hearing was not due to what they had been taught while in service but due to experience. Two of the respondents stated that they would rather risk their hearing than miss a command which could have dire consequences. They explained that in Theatre personal protective hearing devices were used but were frequently pushed to one side to enable the hearing of commands which often led to temporary hearing loss. In contrast to infantry soldiers Gregory et al (2012) looked at hearing thresholds in British army air corps Lynx and

Apache pilots. They researched 59 lynx and 87 apache pilots using a combined method of survey and audiometric testing and length of time in service and flying hours were considered. Hearing loss was less than predicted and there was no difference between the two groups of pilots. There was a significant difference in hearing threshold's for pilots with 20 or more years of service. The results suggested that the use of circumaural earmuffs which are currently built into the flying helmet reduce the risk of noise induced hearing loss. This suggests that compared to the infantry soldiers who removed the ear defenders to hear commands the pilots did not need to do so and this resulted in better hearing outcomes.

Cancer

A frequent diagnosis in the general population is that of cancer and concern has been expressed, certainly from the first Gulf war, that cancer is more prevalent in the military population. McFarlane et al (2003) reported on the outcomes of a study that considered the incidence of cancer among UK Gulf war veterans. This study is included here because of its reporting date. The participants for this study were 51,721 Gulf war veterans and a further 50,755 Service personnel (Era cohort) who were all matched for age, sex, rank, service and level of fitness but not deployed. The outcomes of the study were measured using the incidence of cancer and reporting in the NHS central register. Results established that there were 270 incidents of cancer among those deployed to the Gulf and 269 among the Era cohort. Adjustment for life style factors did not alter these outcomes. In those deployed risk of cancer was not related to the vaccination regime prior to deployment or to exposure to toxins. The study therefore concluded that there is no excess risk of cancer in Gulf war veterans but it would be desirable to undertake follow up studies. The Kings Centre for Military Health Research (2010) supports this view in its fifteen year report that although there is clearly poorer health in UK Gulf veterans there is no unique 'Gulf war Syndrome' and no increase in cancer.

Obesity

A further health concern among serving personnel is the prevalence of obesity. While the service community is generally active and takes regular exercise there has been cause for concern regarding a possible increase in obesity especially as there is a significant link to diabetes. Fear et al (2011) assessed the prevalence of obesity in both the UK military and the general population and also considered self-reporting data. Height and weight data from military personnel were measured with 2,073 men, 308 women and self-reported data was taken from 6,374 men and 609 women. The sample included white Caucasians, Asian, Gurkhas, Black African or Caribbean and other Non-Whites. From the general public 1,121 men, 1,396 women and self-report of 1,234 men and 1,543 women were taken. The results were that obesity i.e. having a body mass index (BMI) of 30 + were 6.2 % in those under 25 years of age and 24.5% in those of 35 years of age in the military men and in the military women 12% in those under 25 years of age and 25 % in those over 35 years of age. The data taken from self-reporting underestimated obesity. Fear et al drew conclusions that obesity in the UK armed forces is a serious problem and there is a need to create awareness of the balance between the demand for high calorific intake and energy expenditure and although less prevalent in those under 25 years of age it is still a cause for concern . A further study reported in May 2011 by Sundin et al,

supports these findings. After assessing 2,448 men and 311 women between the ages of 17 and 55 years from the UK services they concluded that the risk of obesity is highest in the Army and Royal Navy, in whites, lower ranks and older ages. Both studies however do recognise that the measure of BMI can be flawed as someone may be large but without excess body fat.

Conclusions

Early service leavers are the most vulnerable group of the veteran community and this vulnerability is closely linked to childhood adversity. It is important that recruiting personnel be aware of the recruit's background in order to take appropriate decisions to give the recruit the best possible chance of success. There is a higher incidence of depression than PTSD and this should be termed 'military depression' as it differs from that of the general population. Services for veterans should be more familiar with the military stressors that lead to depression and be aware that the family unit is also given adequate support and concerns addressed while on deployment. For example, being in a combat role while being deployed increases the likelihood of mental health problems. There is also significance about the rank and time served and that lower rank within the first 4 years may be contributory factors. Reservists are more likely to suffer mental health problems. Reservists do not have the same level of military social networking or integration as Regulars leading to reduced opportunity for stress outlet. The armed forces decompression period has limitations, which can be amplified for reservists. Evidence clearly demonstrates that difficult family issues or relationship problems are significant situational factors that can result in Service personnel developing mental health problems

Good leadership and good unit cohesion reduce anxiety and mental health problems. Particular importance is placed on the role of the leader recognising that clear leadership direction and level of support have a positive impact on reducing mental health problems. Delayed onset PTSD is more likely to occur if there are several contributory factors such as personal injury, being an Early Service Leaver, having a poor transition, family breakdown or being single. Research indicates that suicide rates in the regular armed forces is favourable on most counts to civilian estimates, although this is less clear within the veteran population. There is therefore a need to increase the research in this area to look specifically at self harm issues and suicidal thoughts for those receiving therapeutic interventions

Alcohol misuse is a contributory factor to mental health problems and anti social behaviour. There is a high use of alcohol in the armed forces once away from active duty and it is well documented that alcohol is a contributory factor to accidents, violence and bullying and this is no different for veterans and may be worse in terms of alcohol misuse. Anti-social and violent behaviour is strongly linked to pre enlistment behavior and those who, during formative years, took part in anti-social behaviours are likely to continue this both in service and as a veteran.

Trauma has without doubt a major impact on veteran's life. Survival from traumatic injury is successful leading to wounded soldiers and their loved ones having to face a life time of disability. The impact on the person and the family is often overwhelming but positive outcomes are possible. Length of deployment has a significant impact on acquired brain injury (ABI). ABI's occur for a variety of reasons, however the length of time on deployment has a significant impact.

This review also highlighted that there is no higher prevalence of cancer in the veteran community than in the general population. Speculation of increased incidence of cancers in military personnel to date cannot be substantiated in the literature. Although there is a growing concern about obesity and nutritional guidance is required to prevent obesity within serving military population to prevent long term health problems as veterans.

In conclusion veterans are physically robust people who are likely to suffer all of the same health complaints as the general population with some areas being slightly increased. It is predicted that in 2020, long-term illnesses, disabilities or infirmities are set to remain the most common source of welfare.

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