

Abstract

Purpose

This study aims to explore the physical, psychological and social wellbeing of veterans who have experienced limb-loss and to ascertain the factors that contribute to the ability of veterans to maintain their independence at various stages in their lives.

Methods

Sixty two life-story interviews were conducted with 32 veterans (aged between 40 and 95) who had experienced limb-loss either during or after military service.

Results

Three overarching superordinate themes and related sub-themes were generated from a detailed Framework Analysis “*Barriers to transition*” describes issues related to employment, legal support and compensation, stigma and loss of identity. “*Disparity of care*” highlights the issues related to military and civilian care and prosthetics service user experience. The final superordinate theme, “*Enduring challenge of limb loss*”, considers stoicism, dealing with pain, mobility, physical isolation and social networks.

Conclusions

The outcomes offer an opportunity to shape future health and social care policy around the requirements of veterans who have experienced limb-loss by understanding the complexity, and ascertaining the factors that contribute to, maintaining long-term independence and rehabilitation.

Keywords: limb loss; military veteran; life-course; health and social care

Introduction

Research with regard to older people who have lost limbs reveals that many older amputees experience difficulties taking part in social activities, are restricted in carrying out daily activities such as self-care, household tasks and visiting friends, and are at increased risk of social isolation (1, 2). Mental health has likewise been identified as a key challenge, with one review suggesting limb amputation in older adults can lead to an ‘accumulation of losses’ including self-esteem, image, independence, social integration, financial security and physical health (3). Furthermore, age at amputation can influence a person’s adjustment to amputation, with younger age typically leading to better long-term prognosis and, therefore, better adjustment.

World War One left the United Kingdom (UK) with a legacy with over 41,000 armed forces personnel requiring major limb amputation (4). A further 9,000 experienced limb loss as a result of World War Two. Recent military operations have added to the population of service personnel who have experienced limb loss. Military amputees are generally a younger group who include both victims of actual military conflict and non-combatant trauma including military exercise and road traffic accidents (4). However, despite the rapid increase in the number of veterans experiencing limb loss as a result of the conflicts in Iraq and Afghanistan, research on limb-loss in the veteran population is less varied than studies conducted with the general population.

There are numerous reasons why military personnel may undergo amputations (5). Some injuries are defined as being attributable to active service or conflict, whilst others occur as a result of illness or injury (e.g. diabetes). Veterans who have lost limbs in recent conflicts in Iraq and Afghanistan have received political and public attention through both medical and political agendas (6). As with any serious or life-changing injury, loss of a limb entails a

substantial period of rehabilitation and adaption. For personnel injured during military service, this adaption period is often complicated by loss of their military career and subsequent enforced transition to civilian life. For those injured post-service, the biographical influence of a military career may shape the coping mechanisms an individual deploys to deal with amputation (7). This paper focuses on a) the ongoing challenge of adapting to civilian life with one or more limb amputations, and b) the influence of a military background on coping responses to amputations experienced post-service.

Regardless of the cause or conflict, the consequence of losing a limb in military service extends well beyond initial recovery and rehabilitation, and there are long-term consequences and challenges that require physical, mental health and social care commitments across the life-course (7-9). The physical and psychological impact of limb-loss places veterans at risk of losing their independence, uncontrolled levels of pain, ill-fitting or uncomfortable prosthetics, co-morbidities, and mental ill health (7).

As with the general population, the amputation creates ongoing challenges for health and social care providers, with specialist prosthetic care often considered a priority(1), and mental health and other support sometimes an afterthought. However, despite their similarities, there are also important differences between these two populations. Military experience itself can influence the behaviour of ex-service personnel, shaping how they respond to challenges in civilian life (10). In this regard, it is essential that health providers understand the characteristics of the veteran population and are aware of the cultural sensitivities associated with having been a member of the Armed Forces in order to ensure the provision of clinically appropriate care (11).

In the UK, the Armed Forces Covenant was enshrined in law in 2011. The Armed Forces Covenant asserts that, when appropriate, veterans should receive special treatment above and

beyond that which may be expected by a civilian. The Covenant mandates that veterans and their families should not encounter disadvantage as a result of their service and that, where appropriate, they should be entitled to special treatment (12). Disadvantage experienced as a result of service may be taken to include the long-term aftereffects of injury and service-related injury amputation. However, others have previously argued that a separate investigation is called for to compare the different circumstances of combat-related limb-loss compared to 'civilian' amputation (13). While serving, healthcare is delivered to service personnel by the Ministry of Defence (MoD). In the UK, the MoD is responsible for providing primary care, dentistry, occupational medicine, community mental health services and rehabilitation, whilst secondary and specialist healthcare is provided by the National Health Service (NHS). Coll et al (2012) argue that veterans returning to the civilian world may need support to adjust to a different landscape in terms of access to health care in the community (14).

There are limited studies which have considered the impact of limb-loss for military veterans across the life-course, and fewer have used approaches in which veterans who have experienced limb-loss were able to provide accounts of their own lived experiences. This study aims to explore the physical, psychological and social wellbeing of veterans who have experienced limb-loss, and to ascertain the factors that contribute to the ability to maintain their independence at various stages in their lives. This study is part of a wider multiple method convergent study.

Materials and methods

This paper used a qualitative methodology. This approach allowed insights into the explanations and theories of social behaviour identified in the experiences of the participants and produces solutions for policy issues or questions (15). The study was granted ethical approval from Northumbria University's Faculty of Health and Life Science ethical committee.

Participants were recruited using purposive and snowball sampling which allowed for variation in the sample with regard to age, military rank (non-commissioned and commissioned rank), mechanism of limb-loss (whether this was during or after military service), nature of limb-loss (upper or lower limb/single, double or triple amputee) and military service (Royal Navy, Air Force and Army). The research was carried out with the military charity Blesma, a support service for UK former service personnel who have lost limbs through any service or post-service causes.

The study included participants who had lost limbs due to conflict in military service, accidents or illness in military service (but not directly due to combat) and various ‘post-service’ causes (Table 1). This maximum variance sample reflects the two levels of membership of Blesma: full members (limb-loss due to military service) and associated members (limb-loss unconnected with service). This sampling strategy can be considered a strength to this study as it ensured a heterogeneous sample and, therefore, a range of narratives and experiences.

Table 1 – Participant Characteristics (N=32)

Two peer recruiters, who were members of Blesma and the research team, were able to use their experience and knowledge to effectively recruit participants to the maximum variance matrix, recruiting all participants involved in this study. The role of the peer-recruiters was to disseminate study information to potential participants, answer questions about involvement in the study, and to act as a bridge between the research team and limbless veteran community. Importantly, both peer recruiters were involved with Blesma and had a shared understanding and shared experiences with potential participants. This ‘insider’s perspective’ was beneficial in the recruitment process itself. The shared experiences and shared understanding between peer recruiters and potential participants were perceived as a positive influence on recruitment, in that it provided reassurance and reduced/removed barriers. In addition to recruiting

participants, peer-recruiters also re-visited participants after data collection in order to ensure that they had not suffered negative consequences from discussing emotional events.

Life story, face-to-face interviews were collected over a period of eight months from September 2016 to July 2017. The data was gathered over multiple interviews with each participant. The interviews lasted between 1.5-3 hours and took place in the participant's home with follow up interviews being carried out by the same researcher, in all but one case. Up to three interviews per participant were carried out. The first interview aimed to cover life prior to the forces, with the second interview covering joining the forces and the third hearing about recruitment, training and operational duties. The second explored the injury and rehabilitation, and the third explored discharge and life after the services. However, it was recognised that participants may want to talk about certain periods in their life in more depth than others, or might go back and forth between different times and experiences. As such, this allowed individual participants a flexible approach to the interview time allocated, to allow sufficient freedom to tell and order their stories as they wished. All interviews were digitally recorded and transcribed for analysis.

Interview transcripts were imported into NVIVO (QSR International), a qualitative data analysis computer software package, and the data was analysed using the Framework Analysis Approach. Framework Analysis was used as it was specifically developed for applied qualitative research that is undertaken to generate policy. In particular, the trustworthiness and transparency of Framework Analysis made it the preferred choice to meet the set objectives of this investigation, and was chosen for this study due to its capacity to handle large quantities of textual data in a rigorous, transparent and logical process of textual analysis (16-18).

The initial stage of this method of analysis involves immersion in data contained in the transcripts of all participant interviews. Transcripts were added systematically to NVIVO to

begin to catalogue emerging themes. In line with the Framework Analysis process, interview transcripts were analysed, and an initial thematic framework was generated using traditional coding, which was then cross-referenced across the dataset using the auto-coding function of NVIVO. This initial thematic framework was highly grounded in the specific details of participant accounts and provided a comprehensive index of themes, which then provided a foundation for further stages of analysis. The next stage of analysis focused on interpreting and explaining the meaning and broader significance of sub-themes. This stage involved a reorganisation of sub-themes around the developing super-ordinate themes, with decisions around the consolidation, amalgamation and reduction of themes driven by the extent to which these were supported across participant accounts. The final stage of analysis involved a process of further conceptualisation of themes. This was undertaken by three Senior Research Assistants (GW, GMc, NF) in consultation with the Principal Investigator (MK). Researchers maintained a particular focus on the aims and objectives of the study, whilst considering the implications of the findings for policy provision. This approach to analysis enabled us to work in an incremental process from themes grounded in the data, through to the more abstract interpretations of the wider significance and meaning of these themes.

This method to facilitate systematic thematic analysis of data and to create a balance between reducing and summarising data and remaining attuned to individual cases (15, 19). A cyclical process was used to refine the superordinate themes. A key strength of Framework Analysis is to provide a clear audit trail of how conclusions were derived from the data.

Results

Thirty-two participants took part in this study. The sample consisted of 30 males and two females, aged between 40-95 years (mean = 69.4, SD = 14.56). Participants represented all three branches of military services, with 19 having been deployed and 13 not having been deployed during their careers. Limb-loss was attributable to service for 14 of the sample,

whereas 18 individuals experienced post-service limb-loss. Most individuals experienced lower limb loss, but the nature of limb loss differed over the sample.

Three superordinate themes were generated from the data: Barriers to transition, disparity of care, and the enduring challenge of limb-loss (Figure 1).

Figure 1. Superordinate themes

Barriers to Transition

The data were analysed with a guiding assumption that transition is not a discrete and linear phase of exiting the military and returning to civilian life, but a protracted process of renegotiating identity and rediscovering a sense of belonging. This process is further complicated by the experience of limb amputation, which caused disruption to the veterans' intended life. Military and post-military employment was affected, and individuals felt that disparities existed in legal support and compensation, as well as stigma and loss of military identity.

Employment

Finding suitable employment was crucial to maintaining independence when transitioning back to civilian life. This was true of independence in a financial sense, but also in a social-relational one; the feeling that veterans could still use their skills and could be recognised as productive individuals, contributing to society. Education and skills developed through the military were not necessarily transferable to the civilian sector, with limitations imposed by limb-loss further restricting options for a new career.

“They’d advise you ‘Well really looking at what you did in the army, I mean really your skillsets [name] are you know well maybe you can do bricklaying? Oh no you’re an amputee now, you might struggle on sites and well really your bricklaying days are over”

(Participant 29, aged 43, male, deployed, post-service limb-loss)

Many participants reported difficulties in obtaining employment after limb-loss and preferred not to disclose their disabilities to potential and actual employers in order to counter the risk that they be may discriminated against.

“I didn’t want people to know I had one leg basically...So when I applied for a job I would never tell them I had a disability... they need to find it out if they want to know”

(Participant 6, aged 55, male, non-deployed, in-service but not attributable limb-loss)

The majority of participants articulated a preference to continue working after they had lost a limb, but found difficulty finding employment and this impacted greatly on their sense of self-worth, reporting that they found the whole process “*demoralising*” (Participant 2 aged 44, male, non-deployed, post-service attributable limb-loss) at times. The determination not to be seen as ‘disabled’ and in receipt of charity was very strong and the harmful effects of unemployment were evident across the study population:

“I don’t want to be seen as a charity. I want to know that I can go out there, earn the money in my own right ... That’s why I won’t apply for all the disability benefits because I don’t want them...I don’t want ... for the country to label me as a scrounger and as a dole-dosser ... I want a job” (Participant 2, aged 44, male, non-deployed, post-service attributable limb-loss)

As such, it was clear that from the veterans’ perspective, gaining meaningful employment post-injury was a key contributing factor towards not only psycho-social wellbeing and a sense of feeling and being ‘independent’, but also an important marker of successful transition. Indeed, for some participants who were injured in-service, there was a dual transition to be made; from being able-bodied to disabled, and from military to non-military employment. This dual

transition created turmoil from some, but was somewhat eased if veterans were able to embark on new career projects which brought them meaning and a new source of income.

Legal Support, Processes and Disparity of Compensation

Receipt of some form of financial compensation, such as a War Pension or an award under the Armed Forces Compensation Scheme (a scheme in the UK service personnel injured in service are compensated for their injuries or illness and awarded a pension dependent on the nature of the injury or illness) appeared important in signifying recognition of military contribution. There was variation in the level of compensation received by participants. Furthermore, some participants highlighted a perceived inequality regarding the entitlement to compensation of those who lost a limb during service, and those injured during active or operational service, and those injured during peacetime or outside of the military.

“So those that would be in my situation, but through conflict they get the best of the best. Those that have served Queen and Country by being injured through peacetime, they get nothing. Big discrepancy” (Participant 2, aged 44, male, non-deployed, post-service attributable limb-loss)

The process of applying for compensation was described as lengthy, impersonal and remote. Participants reported feeling uninvolved in the compensation and war pensioning process and they felt unable to question the outcome.

“But then a blooming...an accountant person sits there on a machine and reduces your claim by 30%. And we have to accept it. We have to accept what the barriers and the lawyers and people say” (Participant 5, aged 60, male, deployed, in-service)

Participants also felt that there was a poor awareness at the time of their injuries of the pensions, compensation and benefits to which they were entitled. Indeed, many participants reported a lack of awareness of their financial rights, and received limited advice in this area, which significantly impacted their transition back to civilian life, and their ability to maintain independence.

“And they [military] provided no advice on war pensions” (Participant 6, aged 55, male, non-deployed, in-service, non-attributable limb-loss)

Participants also encountered difficulties navigating the compensation processes reporting a sense of disempowerment when navigating these systems.

“Even through the process of applying for war disability pension (umm) it has been a nightmare” (Participant 2 aged 44, male, non-deployed, post-service attributable limb-loss)

Access to compensation was perceived as a means to financial security. Participants described how inadequate compensation hindered their capacity to transition successfully into civilian life. From the participants’ point of view, they felt alienated from the decision making process around their compensation entitlements and felt unable to challenge the outcome of the decisions making due to the cost of legal representation.

Stigma

The findings suggest that internal stigma, or the perceived stigma that makes individuals reluctant to seek assistance was prevalent across all participants. Participants reported that the stigma associated with limb loss had a significant impact on their desire to help, or even accept help when it was offered to them. This in turn appears to impact on their ability to adjust to their limb-loss and transition back to civilian life. What was most notable was both the perceived need and the effort to which participants went to project an image of 'normality' in their daily life.

"I don't want to declare myself as a technically (umm) a severely disabled person. Because in your head you don't want to be that person, in your head you want to be normal" (Participant 5 aged 60, male, deployed, in-service limb-loss)

The internalised stigma felt by participants was often exacerbated by what appeared to be unintentional stigma enacted through the attitudes and treatment of others encountered in daily life. Some participants reported feeling patronised by both members of the public and healthcare professionals, as well as an element of macabre voyeurism in relation to the mechanism of injury,

"I still didn't find it easy to talk to... normal... non-disabled people... there's no empathy with you, I mean you're just... you're just asking me all these questions because you're nosey!" (Participant 14, aged 66, male, deployed, in-service limb-loss)

However, a consistent theme across all participants was the observed change in the attitudes towards veteran limb-loss over recent years. Some attributed this to the work of charitable organisations who have increased public awareness, as well as events such as the Invictus

Games and the Paralympics, which they felt may benefit younger veterans who have experienced limb-loss due to ‘greater acceptance’.

“I think purely because of media exposure, people’s attitudes have changed ... I think it’s purely based on the number of people being injured, people probably met many more injured ex ... you know servicemen and women there’s ... sporting... sporting events on Paralympics on TV. A lot of my friends were absolutely glued to it. There is a general acceptance of disability and level of education to be brought is such that there’s much greater acceptance” (Participant 6, aged 55, male, non-deployed, in-service, non-attributable)

Loss of Military Identity

Participants described a sense of grief over the loss of their military career, networks and identity. While some participants were able to continue serving in the military post limb-loss, most were not. Participants who described their early ambitions to join the military and envisioned serving for a full career, reported that they had devoted little consideration to what they might do if, or when, they have to leave the military.

“I hadn’t really give a lot of thought to well what will I do if I leave the army? What will I do if I got injured? You didn’t think about that necessarily. Maybe one or two would, but I hadn’t. I was so career-driven you know and faced on the army. I hadn’t really thought about ‘what if’. So that was a big shock” (Participant 29, aged 43, male, deployed, post-service limb-loss)

However, even where it was possible to continue serving, participants expressed their frustration that they would be unable to advance their careers as planned. Greater experience of civilian life prior to joining the military appeared to facilitate better adjustment during this transitional period. The following participant drew comparisons between their experience, and those who joined the military at a young age.

“I mean I knew a bit of it before I went in so I was basically more prepared to come out on Civvy Street than someone who got in when they were young, did their service and then come out... oh!! I can't imagine it. You know it must have been really hard for some of them. That's why... a lot of them end up on the streets because they can't cope. It's all done for you” (Participant 12, aged 69, male, deployed, post-service limb-loss)

Many participants described having satisfied ambitions by developing a career outside of the military, or in the military charitable sector. Nevertheless, the findings of this study suggest that there are increased vulnerabilities associated with transitioning back to civilian life for those participants who joined the military at a young age and suffered limb loss.

Disparity of Care

The findings suggest that participants had varying experiences of care over the life-course, linked to how and when the limb loss occurred. Most notable were the disparities reported between military and NHS treatment. For instance, the ability to gain timely access to effective care and support was associated by participants with extended periods of increased pain, reduced physical activity and limitations in mobility. The repair, replacement and adjustment of prosthetic limbs emerged as the primary care need affecting them throughout the life-course. The speed and quality of prosthetic care was described as a key factor along with gaining timely

access to specialist prosthetic services. Disparities highlighted under this theme demonstrated several facets to inequality in the care experienced by participants and mark important aspects of experience which help to explain variation in the subsequent trajectories of participants' personal stories, as they adapt to and re-build their lives following limb-loss.

Continuity of Care

Participants reflected on disparities experienced in relation to the provision of prosthetics, the process of rehabilitation and experiences of unsatisfactory care. They commonly expressed the need for ongoing healthcare, specifically tailored to amputees, throughout the life-course.

Poor continuity of care is a significant challenge for veterans affected by limb-loss. Participants described the negative physical impact of ineffective communication between different services (e.g. general practice and physiotherapy services), excessive waiting times between healthcare appointments and a paucity of long-term specialist prosthetic care.

“The GP can do nothing. District nurse says it’s not their business and (umm) [Occupational Therapists] no, physios no” (Participant 25, aged 82, male, non-deployed, post-service limb-loss)

Participants described variation in the quality of care between different limb centres, sometimes describing a ‘postcode lottery’ with respect to accessing care. In response, some participants resorted to paying for private care, while others were forced to travel long distances to access required services.

“The physio it was a... a fifty mile round trip, three times a week” (Participant 8, aged 56, male, non-deployed, post-service limb-loss)

Participants also reported the impact of poor continuity of care between named healthcare professionals, with this increasing the time taken to receive prosthetics and resulting in *“conflicting information”* (Participant 2, aged 44, male, non-deployed, post-service attributable limb-loss). The participants perceived failure of health services to take responsibility for the provision of care, and a lack of co-ordination of treatment, was intrinsically linked to a poor experience of care, resulting in a feeling of not knowing where to turn to for support.

Military vs Civilian Care

Much of the discussion around care centred on the differences between military care, and care provided by the NHS, including the transition between the two healthcare services. Connected with the sense of loss over a military identity articulated above, participants typically favoured care provided by the military. Some preferred military-based care as they felt that the care provided by the NHS was substandard. In addition, many participants drew attention to a lack of specialist treatments available within the NHS in terms of both mental health, and particularly around the ability to fit and manage prosthetics.

“In the NHS there is a massive lack of qualified prosthetists who can actually deal with the robotic legs” (Participant 2, aged 44, male, non-deployed, post-service attributable limb-loss)

It needs to be acknowledged that service personnel, 10 years post-injury, may not be aware of the Veterans Trauma Network (which provides specialist care to veterans with service-specific

traumatic injuries) or Murrison Centres (providing enhanced services to veterans who have lost a limb as a result of their service in the armed forces). The issue here is not in relation to paucity of services but rather a need to raise awareness of available services among the veterans population across the lifespan.

Despite the general preference for military care over that provided by the NHS, some participants reported that the military did not provide them with sufficient follow-up care for their needs, and discussed their disappointment with the lack of support they received post-injury. Indeed, one participant recalled a change in the level of support they received after leaving the military, with this once again highlighting the risk that veterans may be left without support during the significant transitional period of early adjustment to limb-loss.

“While you’re still in the military it’s available, once you leave the military [switch noise] no Headley Court. Nothing” (Participant 5 aged 60, male, deployed, in-service)

Given the perceived lack of support provided by the military post-service, participants highlighted the importance of support provided by Blesma and other charitable organisations.

Prosthetics

The participants also highlighted problems with prosthetics and fittings which veterans are able to access. Those with limb-loss in service, and/or attributable to service, gave examples of multiple limbs they had received since amputation. In particular, participants described the importance of socket fit and major issues caused by ill-fitting sockets.

“Forget the fancy knee joints and technology below it, but the fit is the main thing”

(Participant 6 aged 55, male, non-deployed, in-service, non-attributable)

Some participants highlighted the different regulations of acquiring limbs for younger amputees, and the higher quality prosthetics available to those injured during compared to outside of service as a further illustration of disparity in care.

“I mean look at them now, they get £50,000 legs and aftercare and everything. But before it was just a case of get on with it, you’re a wimp” (Participant 27, aged over 80, male, deployed, in-service attributable limb-loss)

Rehabilitation was pivotal in the care process post-amputation. Due to this continued and “*life-long*” rehabilitation, one participant referred to the prosthetist as the “*most important person in your life, next to your family*” (Participant 7, aged 95, male, deployed, in-service attributable limb-loss). However, not all individuals experienced the same degree of rehabilitation, with some individuals (both those with limb-loss attributable to service and those with non-attributable limb-loss) describing non-existent or inaccessible prosthetics services, or long waiting processes post-amputation.

“It were a month or so before I could get my first prosthetic limb (through the NHS) because obviously you’re all angry, your stumps all angry and sore and sorting yourself out” (Participant 30, aged 79, male, deployed, in-service attributable limb-loss)

“(The NHS have) given you the leg, we’ve told you how to walk, off you go and you just get on with your life” (Participant 2, aged 44, male, non-deployed, post-service attributable limb-loss)

The Enduring Challenge of Limb-loss

There were a number of challenges individuals faced throughout their life course as a result of limb loss. These included persistent stump pain and phantom pain, mobility issues which in turn impacted social connections. It appeared that veterans' dominant response to dealing with such issues was adherence to a mostly inflexible stoicism and a military "get on with it" approach.

Stoicism

Participant attitudes to living with limb loss were often characterised by stoic acceptance, the majority of whom self-ascribed to the philosophy of 'getting on with it' or 'carrying on' in relation to managing and adapting to their limb-loss.

"You've got to get on with it, it's not going to change" (Participant 19, aged over 80, male, non-deployed, post-service limb-loss)

"You've got to have the right attitude to these things I think. But personally I'm the sort of bloke who says I don't care, it don't matter. I'll get over it. That's my attitude. And whatever happens in your life if ...you've got to adapt to something different, you either adapt or you go under as far as I'm concerned get on with it, it as far as I'm concerned"
(Participant 12, aged 69, male, deployed, post-service limb-loss)

"so it was just carry on as normal really wasn't it" (Participant 15, aged 73, male, non-deployed, post-service limb-loss)

Participants also professed their independence and expressed a reluctance to rely upon others or to ask for help or assistance. While this potentially created a barrier to accessing formal and informal sources of support, this was not always the case, and one participant described an increased willingness to accept help as he got older.

“As long as you’re not too proud to not ask for assistance. And I think there is something in that... I am so independent, it is difficult to actually go to them and actually say (umm) I need help’ And what is more vital? Practical help, financial help, welfare assistance, you’ve got to just (umm) accept...” (Participant 5 aged 60, male, deployed, in-service)

Dealing with Pain

A number of participants talked about the challenges of managing pain. A considerable amount of pain was attributed to ill-fitting prosthetic limb sockets. Pain levels were largely uncontrolled, and individuals described pain having an impact on their sleep, mood, and mobility (either directly or by preventing them from using their prosthetics).

“Phantom pain is also a bore. About once a month it comes on in my right stump which jumps around and prevents me walking or sleeping” (Participant 7, aged over 80, male, deployed, in-service attributable limb-loss)

“I’ve got constant pain twenty-four hours a day, all the time” (Participant 8, aged 56, male, non-deployed, post-service limb-loss)

Participants also suggested that clinicians struggled to manage their pain levels effectively and often prescribed high doses of strong painkillers. They expressed concern about becoming medication-dependent and there was little evidence of any alternative approaches to pain management.

“they give you a carrier bagful of medication, Tramadol, Oramorp... and I obviously did... I got addicted to morphine” (Participant 23, aged 75, male, deployed, in-service attributable limb-loss)

In addition, it was felt that such high quantities of medication could potentially constitute a risk to the veterans’ safety.

“I’d stacked all the morphine and all the other tablets I had and I sat there with a pint glass and I emptied a blister of tablets into my mouth” (Participant 2, aged 44, male, non-deployed, post-service attributable limb-loss)

Mobility

As a result of the pain or ill-fitting limbs, many participants described mobility issues which impacted their ability to undertake everyday activities, impinging on their quality of life, their self-esteem and their ability to maintain independence.

“I was always (umm) a very practical person. I’ve done everything in houses. I’ve built extensions (umm) and (umm) maintained cars and all that sort of thing throughout really.

And of course you can't do these things now, not well enough to be satisfied with it"

(Participant 26, aged 55, male, deployed, post-service attributable limb-loss)

While some participants were able to stay active and maintain their engagement in fitness and leisure pursuits, others described their struggle to undertake more basic activities of daily living. The age at which limb-loss occurred also affected the regaining of mobility, with younger veterans described as more able to become accustomed to walking with prosthetics. Likewise, participants described the complications that limb-loss posed to the usual ageing process due to the stress that walking with prosthetics imposed on the body, and the co-occurrence of limb-loss with other long-term conditions. Risk of falling when walking with prosthetics was also a common issue, becoming more difficult to endure with age and inhibiting mobility.

"I think the younger... the guys, the twenties and the thirties and what not that you know have a lot of years to go and were fitter and what not and could resist... make the falls without breaking things and what not. (umm) They were able to master this thing"

(Participant 26, aged 55, male, deployed, post-service attributable limb-loss)

Physical isolation

For some participants who describe being very fit and active prior to injury, changes in physical capability sometimes required psychological adjustment, potentially resulting in frustration at not being able to fulfil usual activities and social roles. Some described how difficulty getting out of the house had resulted in "*worthlessness*" and "*despair*" (Participant 10, aged 49, male, non-deployed, post-service limb-loss), and feeling "*trapped*" within their own home (Participant 27, aged over 80, male, deployed, in-service attributable limb-loss).

This physical isolation resulted in feelings of loneliness among some participants. One participant described a particular vulnerability to loneliness at certain transition points in life, for instance, the death of their partner and when their children left home. Another described how the loneliness worsened during specific times of the year.

“I think personally it’s the (umm) leaving the nest syndrome has hit me quite hard”.

(Participant 5 aged 60, male, deployed, in-service)

“It doesn’t mean I don’t get lonely. I do and I sometimes feel it badly. Times like Christmas are appalling for me” (Participant 9, aged 58, male, non-deployed, in-service, non-attributable limb-loss)

Social networks

Some participants described how limb-loss had altered their ability to form and maintain relationships due to concerns around self-image, an inability to engage in similar activities to others, or other people’s assumptions that veterans who have experienced limb-loss and their families would become reliant upon them. Opportunities provided by third sector organisations were extremely important in helping participants to stay socially connected. The most beneficial group were with peers – either ex-military or other amputees.

“Like-minded people with limbs missing or the loss of use of limb. It’s great banter, it’s military, it’s (umm) social and (umm) I you know I don’t think I could do without it”

(Participant 5 aged 60, male, deployed, in-service)

Discussion

This study illustrates that veterans who are affected by limb-loss require timely access to quality support and specialist healthcare services. Participant narratives highlighted key factors that were important in supporting physical, psychological and social wellbeing, as well as the maintenance of independence. Special attention must be paid to older veterans who experienced limb-loss prior to contemporary medical advances in prosthetic care.

The analysis identified three superordinate themes within the participant's life stories: Barriers to Transition, Disparity of Care and The Enduring Challenge of Limb-loss.

Our findings resonate with previous research on long-term adaptation to limb-loss. For instance, a review of research on psychosocial adjustment to lower limb loss revealed that individuals must adapt their physical and social functioning in response to amputation, and that loss of a limb often necessitates an ongoing process of discovery and accomplishment (13). However, stump pain, phantom limb pain, and coping styles are important mediators of long-term adjustment with some studies identifying a tendency of newly amputated persons to deny the emotional impact of their limb loss and to adopt a 'heroic cheerfulness' in response (20); a finding mirrored in our research.

Extending the previous research in this area, our findings emphasise the significance of undergoing a *dual transition* for military personnel injured during service. This dual transition occurs when personnel simultaneously (or near simultaneously) undergo limb amputation due to serious injury or disease while also navigating the personal and cultural transition from military to civilian life. Each of these transitions involves personal challenges resulting in various needs for support and adaptation. The transition from having a 'tough', active and physically strong military body to being 'disabled' often entails significant personal and social reinvention of the self (21). Likewise, the transition from military to civilian life requires a

veteran to re-learn the ‘rules’ of civilian life and adapt their military ways of being to civilian life and work (10). Based on our findings, we suggest that encountering both of these life-changing events at the same time creates a need for practical and psychological support in order to foster positive adaptation and coping techniques. In particular, undergoing transition from the military under circumstances not of one’s choosing (e.g. via medical discharge compared with ‘normal’ end of service) can leave a service person unprepared for civilian life and unhappy with their career ending, potentially resulting in a kind of grief reaction centred on the loss of military career, identity and community.

Given these unique challenges that military personnel face, in addition to the aforementioned challenges of adapting to amputation, it is important to consider the pathways of support available to personnel facing the dual transition of limb-loss and medical discharge. Like the U.S., the UK seems increasingly to be adopting a sports-based model of rehabilitation for wounded and injured personnel. This is evident not only with the rise of the Invictus Games as an annual international sporting fixture, but also with the adoption of sports-based rehabilitation approaches among a wide network of local and national military charities. This approach presents many advantages, as documented in previous research (6). Indeed, it is suggested, sport and physical activity can help veterans rediscover meaning and purpose in the wake of life-changing injuries, provide fun and positive social interactions, as well as a means of ‘active coping’(6). However, there may also be drawbacks. As Messinger has revealed, focusing heavily on sport potentially omits other life domains (such as work, study, and the pursuit of other new opportunities) which may be of equal – or potentially greater – value in terms of veterans’ ongoing and future life trajectories (21). Indeed, our study pointed out the significant role of work and career in veterans’ post-injury lives, suggesting that bespoke services designed to support veterans who have experienced limb-loss in pursuit of new career opportunities may be particularly valuable for ongoing rehabilitation.

Attitudes among military veterans to seeking help are likely to be intensified by traits such as stoicism, psychological resilience and reserve. These traits are promoted in military culture and highly valued (22) and point to important factors that may not be consistent across the non-veteran, ageing population. The emerging themes present an array of differences related to access, use and experience of care by 'older' veterans who have suffered limb-loss.

This study has shown that maintaining independence across the life-course is a combination of physical, psychological and social functions. Veterans who are affected by limb-loss require timely access to high quality support and specialist healthcare services, starting from the time of amputation and extending throughout the life course in order to maintain independence.

Healthcare providers and policy makers must ensure that every veteran who has experienced limb-loss is able to access services when required and should aim to standardise the quality of care across services.

Health and social care providers must be aware of the increased vulnerability of veterans affected by limb-loss as they age. In order to ensure that veterans are able to maintain their health, wellbeing and independence for as long as possible, special attention must be taken to ensure that older veterans receive sufficient care and support to manage their healthcare needs.

Veterans who joined the military at a young age may be at a significant disadvantage in terms of securing employment after leaving the military. Efforts to improve the accreditation of skills gained within the military should continue. Additionally, care should be taken to ensure that veterans who are living with limb-loss receive the support and advice they require in order to access education and training opportunities after limb-loss.

This study has limitations in that it does not fully represent female veterans who have experienced limb-loss as only two took part in this study. In addition, this study does not explore similarities or compare non-military personal or younger amputees where limb-loss has resulted from

traffic accidents or injuries. Furthermore, all participants involved in this study were members of BLESMA. Therefore, the findings are potentially not transferrable to non-members.

References

1. Horgan O, MacLachlan M. Psychosocial adjustment to lower-limb amputation: a review. *Disability and rehabilitation*. 2004;26(14-15):837-50.
2. Briggs W. The mental health problems and needs of older people following lower-limb amputation. *Reviews in clinical gerontology*. 2006;16(2):155-63.
3. Warren N, Manderson L. Constructing hope: Dis/continuity and the narrative construction of recovery in the rehabilitation unit. *Journal of Contemporary Ethnography*. 2008;37(2):180-201.
4. Stewart CPU. Synopsis of causation: amputation of the lower limb. Ministry of Defence. 2008.
5. Cifu D. Geriatric rehabilitation services in the veterans health administration. *Generations*. 2010;34(2):64-73.
6. Caddick N, Smith B. The impact of sport and physical activity on the well-being of combat veterans: A systematic review. *Psychology of sport and exercise*. 2014;15(1):9-18.
7. Caddick N, McGill G, Greaves J, Kiernan MD. Resisting decline? Narratives of independence among aging limbless veterans. *Journal of Aging Studies*. 2018;46:24-31.
8. Geiling J, Rosen JM, Edwards RD. Medical costs of war in 2035: long-term care challenges for veterans of Iraq and Afghanistan. *Military Medicine*. 2012;177(11):1235-44. doi: 10.7205/MILMED-D-12-0003. PubMed PMID: 108079546. Language: English. Entry Date: 20130201. Revision Date: 20150712. Publication Type: Journal Article. Journal Subset: Biomedical.
9. Hunt N, Robbins I. World War II veterans, social support, and veterans' associations. *Aging & Mental Health*. 2001;5(2):175-82. PubMed PMID: WOS:000169361600010.
10. Cooper L, Caddick N, Godier L, Cooper A, Fossey M. Transition from the military into civilian life: An exploration of cultural competence. *Armed forces & society*. 2018;44(1):156-77.
11. Algire M, Martyn D. Enhancing emergency nurses' knowledge of veterans' health needs. *Journal of Emergency Nursing*. 2013;39(6):570-5.
12. Ministry of Defence. The Armed Forces covenant annual report 2018. London: Ministry of Defence; 2018.
13. Desmond DM, MacLachlan M. Coping strategies as predictors of psychosocial adaptation in a sample of elderly veterans with acquired lower limb amputations. *Social science & medicine*. 2006;62(1):208-16.
14. Coll JE, Weiss EL, Yarvis JS. No one leaves unchanged—insights for civilian mental health care. *Advances in social work practice with the military*: Routledge, New York; 2012. p. 18-33.
15. Spencer L, Ritchie J. Qualitative data analysis for applied policy research. *Analyzing qualitative data*: Routledge; 2002. p. 187-208.
16. Bryman A, Burgess RG. Reflections on qualitative data analysis. *Analyzing qualitative data*. 1994:216-26.
17. Kiernan MD, Proud C, Jackson S. The juggling act: Do student nurses who care for dependants need an adapted course? An applied policy research study. *Nurse education today*. 2015;35(11):1085-90.
18. Kiernan MD, Hill M. Framework analysis: a whole paradigm approach. *Qualitative Research Journal*. 2018.
19. Phoenix C, Smith B, Sparkes AC. Narrative analysis in aging studies: A typology for consideration. *Journal of Aging Studies*. 2010;24(1):1-11.

20. Thompson DM, Haran D. Living with an amputation: What it means for patients and their helpers. *International Journal of Rehabilitation Research*. 1984.
21. Messinger SD. Incorporating the prosthetic: Traumatic, limb-loss, rehabilitation and refigured military bodies. *Disability and rehabilitation*. 2009;25(31):2130-4.
22. Forbes H. The uses of the uncultivated landscape in modern Greece: a pointer to the value of the wilderness in antiquity? *Human Landscapes in Classical Antiquity*: Routledge; 2013. p. 82-111.

Table 1 – Participant Characteristics (N=32)

Age at interview (years)	69.40 (14.56)
Mean (SD)	43-95
Range	
Sex	
Male	30
Female	2
Service	
Royal Navy/Marines	7
Army	19
Royal Air Force	5
Cadet	1
Operational service	
Deployed	19
No deployments	13
Mechanism of limb loss	
In-service attributable	11
In-service non-attributable	2
In-service unclear	1
Post-service accident	9
Post-service attributable	2
Post-service illness	7
Nature of limb loss	
Above knee	14
Below knee	10
Through knee	1
Arm	1
Double amputee	4
Quadriplegic	1
No limb loss but loss of use	1

Figure 1. Superordinate themes



