Final Report (February 2022)

UNITS: Understanding Needs and Interventions for the Treatment of Scarring: The psychosocial impact of conflict-related disfigurement.

Project Acronym: UNITS

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Research team:

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Centre: This work was conducted at the Centre for Appearance Research, University of the West of England, Bristol (UWE). It has constituted the stream of psychosocial research at The Scar Free Foundation Centre for Conflict Wound Research.

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EXECUTIVE SUMMARY

The nature of military service means that some personnel, especially those serving in combat roles during wartime, sustain injuries resulting in changes to their appearance (e.g., scarring from burn injuries, or limb loss). Between April 2005 and March 2020, 10,100 UK service and ex-serving personnel (veterans) were in receipt of Armed Forces Compensation due to 'injury, wounds and scarring' (Ministry of Defence, 2020a) and 336 UK personnel sustained injuries that included traumatic or surgical amputation of one or more limbs (Ministry of Defence, 2020b).

Research with the civilian population indicates that an appearance that is different from 'the norm' and considered to be disfiguring by the affected person or others, can present significant psychological and social challenges. These can include negative impacts on body image, self-esteem, confidence (Lawrence et al., 2006; Rumsey & Harcourt, 2012; Clarke et al, 2014), managing the stigmatising reactions and behaviours of others (staring, inappropriate comments, avoidance and unsolicited questions about their appearance), maintaining and establishing intimate relationships (particularly after burns or limb loss), and facing barriers to fulfilling employment (Geertzen et al, 2009; Rumsey et al., 2012; Martin et al, 2017; Matthias & Harcourt, 2014). For some, this can result in social avoidance and isolation associated with the distressing belief that they are being judged negatively because of how they look (Kool et al., 2017).

Yet, despite a sizeable body of evidence into psychosocial issues surrounding visible difference (disfigurement; unusual or altered appearance) amongst civilians, there has been a dearth of research into the specific psychosocial needs of those who have sustained appearance-altering injuries (AAI) as a result of military conflict. Likewise, research has overlooked the experiences and needs of their families.

It would be premature to assume that the experience of 'looking different' is the same for people who have an altered appearance as a consequence of a conflict injury as it is for those with AAI sustained in other ways. This three-year programme of mixed methods research therefore set out to answer the question "What are the psychosocial support needs of members of the Armed Forces Community who are affected by appearance-altering conflict-related injuries, and how can they be addressed?" This involved addressing the following questions:

- What are the experiences, appearance-related concerns, and support needs of currently serving military personnel, veterans and family members affected by conflict-related AAI?
- To what extent are the factors that predict psychosocial adjustment to an altered appearance/visible difference among currently serving and ex-service personnel similar or different to those that predict adjustment among a comparative sample of adults without a military background?
- Could existing psychosocial interventions and support materials for adults with AAI, without a military background, be suitable or adapted to meet the needs of currently serving and ex-service personnel with conflict-related AAI?

This involved a programme of related studies:

- a gap analysis which included a literature review (Keeling et al, 2020) and an interview study of health professionals (Williams et al, under review)
- a series of qualitative studies which involved 40 interviews with 20 veterans and 3 currently serving personnel with altered appearances as a result of conflict-related injuries (Keeling et al, under review), and 17 family members (11 partners and 6 mothers) (Keeling et al, in preparation)

- an online survey to compare whether experiences and psychosocial adjustment amongst 121 military veterans with AAI are similar or different to 197 civilians with AAI (Keeling et al, in preparation).

In addition, this work involved:

- extensive consultation with stakeholders and veterans with lived experience of AAI (including members of the CASEVAC Club)
- developing a set of preliminary resources to improve the evidence-based support available to veterans and serving personnel with AAI, and gathering acceptability data from key stakeholders and PI advisors.

The findings from these studies highlighted psychosocial difficulties experienced by veterans and serving personnel with AAI, and their families, limited availability of evidence-based appearance-specific support to meet their particular needs, and a desire from those working with these groups for training and resources to help them meet these needs. The experiences, adjustment and coping strategies reported by military participants compared with those without a military background indicated that interventions based on Acceptance and Commitment Therapy (ACT) and incorporating social skills training would be the most beneficial, but they must be tailored to the distinct needs of military populations with AAI.

A multi-level, stepped model of care, is needed and prototype resources (self-help materials for serving personnel and veterans with AAI; an infographic to raise awareness of the issues among those working with the Armed Forces Community; training resources and an assessment tool for support organisations and health professionals working with these groups) were developed. Feedback from veterans and support organisations showed they were welcomed and deemed acceptable, as a proof of concept. The infographic is being disseminated to raise awareness of the issues raised in this research programme. Further research is needed to evaluate the effectiveness of the prototype resources before they can be made available for use.

UNITS has shone a spotlight on a previously overlooked area of research. Through a series of related rigorous qualitative and quantitative studies, this programme of work has demonstrated the need to provide evidence-based appearance-specific support to enhance the mental wellbeing of veterans and serving personnel with AAI, and their families. Full development, evaluation and implementation of an ACT-based self-help intervention incorporating social skills training for serving and ex-service personnel with AAI and resources for organisations supporting those personnel, is now needed, and further research is needed to develop support materials for families. This work has also identified topics warranting focussed attention in further research, including the impact on romantic relationships, the impact of genital injuries, employment experiences of veterans with AAI, and the experiences and support needs of the children of veterans with AAI.

To date, one academic paper from this work has been published, another has been accepted subject to minor revisions, and three are being prepared for submission. Twelve conference presentations and invited talks, a designated episode of the Appearance Matters Podcast, and a free webinar event have taken place (see Section 3 for further details).

MAIN ACHIEVEMENTS

We completed a comprehensive programme of research, as proposed in our grant application, within budget and despite the challenges presented by the COVID-19 pandemic. Specifically, we have:

- Successfully navigated the complexity of multiple Ministry Of Defence Research Ethics Committee (MODREC), NHS and University ethics approval processes, and were praised by ethics committees for the quality of the proposed research and materials presented to them.
- Identified a gap in the existing research literature and service provision for military personnel and veterans with AAI.
- Recruited a total of 370 participants into a programme of studies (144 serving and ex-serving personnel with AAI; 17 family members/partners of military personnel with AAI; 197 members of the general population with AAI and 12 health professionals working with serving and ex-service personnel with AAI).
- Identified that psychosocial support is required to meet the specific needs of military personnel and veterans with AAI, and that Acceptance and Commitment Therapy (ACT) would be an appropriate therapeutic approach to meet their needs.
- Adapted existing resources and created prototypes of new materials that could meet the specific support needs and preferences of serving personnel and veterans with AAI.
- Created resources (see Appendices) to raise awareness amongst relevant professionals and organisations of the experiences and support needs of people affected by AAI as a consequence of military conflict.
- Gathered evidence of the acceptability of these resources from stakeholders (including veterans with lived experience of AAI, clinical advisors from DMRC Stanford Hall, Blesma, Help for Heroes, OP Courage, Combat Stress, and the NHS Salisbury War Injury Clinic) and PI veteran advisors with lived experience of AAI. Their feedback has informed plans for future work to develop, evaluate and disseminate effective ACT-based interventions incorporating social skills training, to meet the support needs of military personnel and veterans affected by AAI.
- Submitted grant applications for further funding to continue this work.
- Engaged, throughout this programme of work, with advisors with personal experience of the impact of AAI due to conflict-related injuries (military veterans and family members), a wide range of support organisations, NHS providers, government departments (Ministry of Defence (MoD), Office of Veterans Affairs (OVA)) and military academic researchers.
- Carried out a comprehensive programme of dissemination including an online webinar, conference presentations, invited talks, a podcast episode and peer-reviewed publications.

PATIENT BENEFIT

This work has raised awareness of the need to:

- provide effective evidence-based support to military personnel and veterans affected by AAI, and their families
- overcome barriers to discussing appearance-related issues
- train NHS providers and support organisations to recognise, discuss and provide support for those military personnel and veterans whose lives are negatively affected by AAI.

These steps, informed by this research, would offer benefits to those affected and their families.

WORK UNDERTAKEN

Before detailing the work that has been undertaken, it is imperative to acknowledge the impact of COVID-19. From the outset, this was going to be an ambitious and potentially challenging programme of work. The pandemic has presented additional, unexpected challenges since March 2020. However, the UNITS programme of work has continued, without break, throughout the pandemic. The researchers made the shift to working from home and quickly moved the research online (using Qualtrics for online survey data collection, running Steering Committee, Project Team and Advisory Group meetings on Microsoft Teams, giving conference presentations as part of online events, and hosting a dissemination webinar event via Zoom). It is a testimony to the dedication of the researchers that this programme of work continued so smoothly and successfully throughout this exceptionally difficult time. The continued engagement, throughout the pandemic, of people whose lives have been impacted by conflict-related AAI, NHS health professionals and support organisations is further evidence of the importance and appreciation they have given to this research.

The following section provides a summary of each study conducted within the UNITS study. All necessary MODREC, NHS and University ethics approvals were obtained, and UWE's research governance protocols and requirements were followed throughout. At the outset, a detailed signposting booklet was created for participants who may have benefitted from information and/or support for issues including mental health, housing, alcohol, drugs and gambling. Given the lack of resources specifically for military personnel and veterans with AAI, this booklet directed those with appearance-related concerns to resources developed for a civilian population (including the support organisations Changing Faces, the Katie Piper Foundation, Dans Fund for Burns, and the Limbless Association).

i) Gap analysis:

Aim

- To determine the nature and prevalence of body image and psychosocial concerns and associated support needs among military personnel and veterans with conflict-related AAI.

Activity

A narrative review was conducted, taking a systematic approach to search for published and grey literature using BioMed Central, Cochrane Library, Google Scholar, Ovid, PubMed, PsycINFO, SAGE Journals, Science Direct, SpringerLink, Taylor & Francis, Web of Science, and Wiley Online. Searches took place between September 2018 and January 2019, and again in November 2019. The literature search identified 427 papers that were judged against the eligibility criteria, but only four were eligible and relevant for the review.

Summary of results

Limited research investigating body image and psychosocial concerns among military personnel and veterans with AAI exists. The four identified papers indicated that combat injured veterans may experience body image distress and symptoms of depression, anxiety, and social anxiety, and military culture may enable resilience. None of the research in this review had been conducted in the UK.

Conclusions

Despite a substantial number of combat injured veterans with AAI, limited research has aimed at understanding the psychosocial impact of a changed appearance and the related support needs of those affected. The four reviewed papers provide evidence that conflict injured veterans with an altered appearance can experience psychosocial challenges consistent with those experienced by civilians with a visible difference. However, they demonstrate military specific nuances suggesting there may be

additional factors affecting injured veterans' psychosocial experience of their changed appearance. Therefore, the use of existing interventions and support materials for civilians may not be appropriate or effective for individuals whose appearance has changed as a result of a military conflict injury. This review highlights a need for further research to determine the scope and nature of the psychosocial impact of AAI among conflict injured veterans and this should be used to inform the development and implementation of evidence-based interventions and support materials. The role of the military context and culture in adjustment to an altered appearance after injury, and the development of interventions and support, needs investigation.

A paper on this review (Keeling et al, 2020) has been published (see Appendix 2).

ii) Qualitative studies:

Qualitative study 1: Health professionals' experiences of supporting veterans with appearance-altering injuries

In addition to the three qualitative studies specified in the original grant application and outlined below as qualitative studies 2, 3 and 4, Ms Victoria Williams (Research Associate on the UNITS study) conducted a qualitative study as part of her MSc Health Psychology at UWE, Bristol, interviewing health professionals working with veterans with AAI. Her time on this study was not funded by the Scar Free Foundation grant, but we are including it here since it complements the funded work and was supervised by Dr Williamson (Co-Chief Investigator of the UNITS programme).

Aim

- To explore health professionals' experiences of supporting veterans with appearance-altering injuries to understand the psychosocial impact of these injuries, how professionals currently provide appearance-related support and consider directions for improving appearance-related support.

Activity

Semi-structured telephone interviews were conducted with 12 healthcare professionals from multi-disciplinary backgrounds with experience of caring for veterans with AAI, recruited through the NHS, veteran charities, and social media. Data were analysed using Reflexive Thematic Analysis (Braun & Clarke, 2019).

Results

Four themes were developed: Function over form; Social acceptability impacts social comfort; Balancing act; and, Feeling shut out. Healthcare professionals reported that veterans tend to focus on physical function rather than the impact of their AAI on their psychosocial well-being, despite experiencing profound appearance-related social stigma (including staring, abusive comments and inappropriate questioning) that can impact their social confidence. Health professionals also expressed a lack of confidence in raising the topic of appearance with veterans, finding it difficult to overcome barriers that veterans' raise when conversations touch on psychosocial issues. They also felt they lacked knowledge about how best to support those clearly struggling with the social and emotional impact of their AAI. Health professionals emphasised that understanding the role of military culture is important to veteran-centred support.

Conclusion

Further research is required to crystallise these findings with veterans' accounts and to develop tailored training for health professionals around appearance-related, military-specific psychosocial care.

A paper on this study is under review at the academic journal Military Behavioral Health.

Qualitative Study 2: The psychosocial experiences of appearance-altering injuries sustained during military operations among UK military veterans and serving personnel

Aim

- To understand the psychosocial impact of living with an altered-appearance and support preferences among military personnel and veterans who sustained AAI.

Activity

In-depth semi-structured interviews were conducted with 23 participants (20 veterans, 3 serving personnel) who had sustained AAI during deployments or training since 1969 (to be inclusive of those injured in modern combat since 'The Troubles' in Northern Ireland, and including the Falklands and first Gulf War). Their injury had to have occurred at least one year prior to the interview. Telephone interviews were recorded and transcribed verbatim. Transcripts were analysed using Reflexive Thematic Analysis (Braun & Clarke, 2006; 2019). Table 1 is a summary of the sample characteristics.

Table 1: Sample characteristics

Sociodemographic Characteristics		**Injury Characteristics**	
Gender		***Type of injury***	
Female	1	Physical scarring	14
Male	22	Traumatic limb loss	2
Ethnicity		Scarring & limb loss	7
Black Commonwealth[1]	1	***Type of limb loss***	
White British	21	Single lower limb	4
White Commonwealth	1	Double lower limb	4
Mean Age at interview (range)	38.48 (32 – 53)	Double lower & single upper	1
Military Characteristics		***Mean years since injury*** (range)	10.22 (5 – 27)
Serving status at time of interview		***Cause of injury***	
Serving	3	Direct enemy action	19
Left service (veteran)	20	Fall (on deployment)	1
Service branch		Training accident (non-deployment)	3
Naval Services	1	***Location injury sustained***	
Army	21	Afghanistan	17
Royal Air Force	1	Iraq	2
Engagement Type at time of injury		Northern Ireland	1
Regular	21	Training exercise in the UK	3
Reserve[2]	2	***Time period injury sustained***	
Mean years military service (range)	11.78 (4 – 26)	Pre 9/11	1
Mean years since discharge (range)	6.15 (1 -26)	Post 9/11	22

Summary of results

Six master themes were identified, each with sub-themes (see Table 2). These reflect the appearance-related challenges and distress, protective experiences, coping approaches, and support experienced by the participants.

Table 2: Master themes and sub-themes

Master themes	Sub-themes	Illustrative quote
Appearance-related challenges	• Intrusion, stigma and feeling different.	• *So, um asking questions, looking, asking to touch, it's just all of these things … And they ask all of these probing questions which I find a bit inappropriate.* (John, serving).
	• Loss of military physique and fitness.	• *And then you start putting weight on and then you put too much weight on *laughs* …that's never a good look. A sort of just a blob with limbs missing. Er and then you start sort of trying to get under control of how you should be eating and you should be training and stuff…* (Mark).
	• Scars as a reminder.	• *I've still not accepted it. So, um, but that's got, you know and the scar tissue is a reminder of that, which is why I've decided to try and get it covered up* (John, serving)
	• Romantic relationships and intimacy.	• *that's a massive impact on you a massive impact and it you know it's a typical guy thing I'm sure um …you've lost something that makes you a man.* (Paul)
	• Impact on children.	• *And he got picked on, for, his mum only having one leg and, we didn't know about this until quite later on* (Alice)
Psychological impact of appearance challenges	• Increased salience of appearance.	• *When it first happened, I did think that well I was disfigured you know…yeah, I think the initial thing was yes I, I am I have been disfigured.* (Simon)
	• Appearance-related distress.	• *I felt like I looked like a hanging piece of meat in a butchers, if you know what I mean, and I felt that was a lot to do with my looks.* (Ethan)
	• Accepting and adjusting to how I look now.	• *I still clock myself, I'm surprised every now and then, and I catch it in a mirror … I still overestimate what I can do and what I look and you know I don't know how long that takes to adjust but I'm not there yet.* (Arron)
	• Co-morbid mental health difficulties.	• *I had to live with it, and with the guilt of that, for quite a long time and I found it tough, it's not been easy… I weren't proud of being (pause) a survivor, I was really, I couldn't talk about it for a long time* (Benjamin)
Protective experiences	• Expecting to be injured.	• *So, I guess if you're a civilian and you're you know I've got a friend of mine who was just out for a night out with his friend and got hit by a car and he had to wake up minus both his legs, but he was never in the situation where he expected anything like that to happen so the adjustment phase seems to be a lot more difficult.* (Arron)

	• Injured veteran peer support.	• *If you've got a problem the chances are one of them has already been through it or, if not, there's a load of blokes that are willing to help you.* (Patrick)
	• Being seen as an injured war veteran.	• *Was proud to be able to like an amputee and because of my service, at that stage, so... I suppose, I kind of thought of like yeah as a like a badge of honour *laughs*.* (Charles)
	• Being in spaces where looking different is normalised.	• *…but then, when you're at Headley [military rehabilitation centre] you're in that little Headley bubble and everyone there's normal no matter what the injury and, once you're away from that environment and you're in with like real people it sometimes, you can have people can be negative to you indirectly and it can affect you.* (Alice)
	• Accepted and protected by significant others.	• *My husband loves me for who I, you know, for who I am, um body parts and no body parts, he loves every wobbly bit of myself* (Alice)
Cognitive coping	• Making meaning of scars.	• *I kind of felt like I deserved to be punished um and I deserved the scarring coz of what happened to that young man.* (John, serving)
	• Rationalising enacted stigma.	• *I just brush it off because yeah, it's important to think these are people who've maybe never seen an amputee before or seen such a lot of scarring on people. And I was obviously the same. I never knew nothing about amputees or that until I'd actually been sent to Headley Court.* (Charles)
	• Downplaying the importance of appearance.	• *So, I, you know, it was just all about, really it was all about what I could achieve, you know, what could I do, what does my body allow me to do. Um. As opposed to, 'What did it look like?'* (Daniel)
	• Accepting what you can't change.	• *Instead of shying away from stuff you know I'm not gonna change what's happened my legs not gonna grow back I'm not a gecko, so it sort of, accepts that you know that shit hit the fan, I've been through something, and, I'm not gonna change it nothing can change that so it's sort of, learning to live with it and embrace it a little bit if that makes sense.* (Patrick)
	• Optimistic outlook.	• *I started thinking there's light at the end of the tunnel, I can't sit around feeling sorry for myself all my life coz it doesn't get you anywhere.* (Benjamin)

	• "It could have been worse".	• *I just happened to be the unfortunate bugger that come out of it, well, my mate, he come off a bit worse because he's dead. You know, that could've been me, so it could've been the other way around so you know it's a lot of it's about attitude, and I think that transfers into appearance and how you deal with that.* (Paul)
Active coping	• Rebuilding self.	• *I was proud of myself for I could've packed it in I could've said no this isn't for me …but I pushed on with it, with their help and I got there and I managed to do it…. and that built my confidence massively, so that was quite a big leap for me … little bits of confidence building is the way to go* (Paul)
	• Recovery via sporting activities.	• *Getting involved in sport and adaptive sport actually it's helped me kind of come to terms again you know come to terms with these scars and the injury and actually be a lot more comfortable with it.* (Henry)
	• Creating a safe narrative to manage others.	• *You go well his job was to search for IEDs, yeah well you missed that one, you know and it's and it's funny and it's just part, maybe that is just part of the coping.* (Charles)
	• Making it work for me.	• *If I'm in a situation where I don't I'm not feeling comfortable and confident then I'll ask myself the question do I need to be here? Is this important to me? No, it's not, okay let's fuck off.* (Paul)
	• Avoidance.	• *Probably that's why I didn't wear shorts so often, because I don't want people to see that.* (Dominic)
Appearance support, delivery and barriers	• Obstacles to acknowledging appearance.	• *Definitely, definitely, definitely, it were really important (appearance) at the time, I just couldn't address it, couldn't, couldn't put a label on it.* (Benjamin)
	• Appearance support we'd like.	• *Even just someone saying by the way when you go out people are going to stare and they're going to ask you questions and they're going to do this this and this and this is how you're going to feel when you wear certain clothes and um you know almost like a life education workshop would have just been so valuable, um and you know that almost automatically comes with ways in which you can solve the problem.* (Arron)
	• Delivery preferences.	• *I don't know he was just a nice guy and you're sat there very casually there was nothing formal about it he came into the hospital I was still sitting there with bandages on and he's chatting away to me.* (Paul)
	• Barriers to care.	• *I'm in an environment where if I ask for help, it shows a sign of weakness, it's all crap but that's the kind of thing that that goes around.* (Alice)

Conclusions

The analysis of these interviews indicates that in the context of the broader recovery experience, military personnel and veterans experience a variety of challenges related to their changed appearance and body image. Many of these experiences are consistent with evidence from the general population who have sustained burn injuries and limb-loss, but nuances in the challenges, protective experiences, coping approaches, and barriers and preferences for support are evident. These differences indicate that support developed for the general population may not be directly transferrable to supporting military populations experiencing appearance distress and body image concerns.

A paper on this study has been submitted to the academic journal Military Psychology and has received a conditional acceptance for publication following adequate response to reviewer comments (see section 3).

Qualitative study 3: The experiences, appearance-related concerns and support needs of parents of injured veterans

Aim

- To investigate the experiences, appearance-related concerns, and support needs of parents of veterans affected by appearance-altering combat injuries.

Activity

Telephone interviews were conducted with six mothers of British Armed Forces veterans who had been physically injured during operational deployment or whilst training for deployment, where their injury had permanently changed their appearance. Their sons' injuries had occurred since 1969 but at least one year prior to the interview. The semi-structured interviews were recorded and transcribed verbatim and analysed using Reflexive Thematic Analysis (Braun & Clarke, 2019).

Five of the interviewees' sons had been in the Army, and one had served as a Marine. Two sons were Captains, one was a Lieutenant, one was a Sergeant and two were Privates. Two sons had a single amputation, one had a double amputation, one had a triple amputation and one had scarring.

Summary of results

Appearance-related concerns were an important part of the interviewees' experience, within the broader context of having an injured military son and the many other stresses this presented them with. Their experiences were captured across two main themes which reflected: 1) the distress of their son's AAI; 2) being unable to express this distress and/or access support. Their son's appearance was at times emotionally overwhelming for them. They worried that others might judge their son based on his appearance and not offer the respect he deserved for being a veteran injured during service, but despite their anguish some mothers were unable to express their distress due to interpersonal, internalised, and structural barriers to support. There was an overall lack of support for mothers, but a specific absence of support around the appearance change. This was identified as an unmet need.

A paper on this study is being prepared for submission to the academic journal Military Behavioral Health.

Qualitative study 4: The experiences, appearance-related concerns and support needs of partners of injured veterans

Aim

- To investigate the experiences, appearance-related concerns, and support needs of partners of veterans affected by appearance-altering combat injuries.

Activity

Telephone interviews were conducted with 11 female partners of British Armed Forces veterans who had been physically injured during operational deployment or whilst training for deployment, where their injury had permanently changed their appearance. Their partners injuries had occurred since 1969 but at least one year prior to the interview. The semi-structured interviews were recorded and transcribed verbatim and analysed using Reflexive Thematic Analysis (Braun & Clarke, 2019).

Ten of the interviewees' partners had served in the Army and one had served in the Royal Air Force (RAF). All of their partners had been injured in Afghanistan, seven had physical scarring and limb loss and four had physical scarring only. Seven of the interviewees were in a relationship with their injured veteran at the time of injury and four had formed their relationships post-injury.

Summary of results

Overall, the partners were not only aware of the challenges their injured partners experienced due to looking different, but also recalled and shared their own experiences of having to manage public reactions, as well as for those with their partner at the time of injury having to adjust to them looking different. Impact on relationships and children were also reported. Despite the challenges, there was evidence of personal growth individually and as couples. Ways of coping and adjusting were shared, including the importance of peer support and learning to value and accept difference. Despite the growth and ability to cope, the interviewees shared how they would have liked support adjusting to the challenges, especially around managing public attention. These experiences were represented in four themes: 'challenges of looking different', 'positive outcomes' 'how life continues' and 'unmet needs and barriers to support'.

A paper on this study is being prepared for submission to the academic journal Military Behavioral Health.

iii) Online survey

Body image and appearance distress among military veterans and civilians with an injury-related visible difference: A comparison study

Aims

To address two research questions:

1. To what extent are the factors that predict psychosocial adjustment to an altered appearance among military veterans injured in a military conflict context similar or different to those that predict adjustment among a comparative sample of adults without a military background?
2. Can existing interventions and support materials for adults with appearance-altering injuries but without a military background be suitable or adapted to meet the needs of military veterans with conflict-related AAI?

Activity

Determining the content of the survey was a significant task, since debate regarding definitions and indicators of adjustment to a visible difference (altered appearance) persists within the existing literature based on civilian research. For the purpose of this study, outcomes were based on the findings of the qualitative studies (see above). Specifically, satisfaction with appearance, the extent that appearance-related concerns impacted social, recreational and vocational activities (life engagement), concern about being judged negatively on the basis of appearance, social anxiety and depression were selected as outcomes. Factors likely to play a role in determining levels of adjustment (as indicated by these outcomes) were identified from the visible difference literature more broadly (see Rumsey et al, 2013) including perceived support and dispositional outlook (optimism). Zucchelli et al (2018; 2020)

have recently indicated the role of body image flexibility (the capacity to experience the perceptions, sensations, feelings, thoughts, and beliefs about the body fully and intentionally while pursuing effective action in other life domains) and self-compassion as important modifiable influences on outcomes. These were included in the survey, in addition to other potential influencing factors (see below).

A cross-sectional design was used, with an online survey comparing veterans and civilians with AAIs. Two surveys were developed to collect data from these two groups. The surveys were identical except for questions that were only relevant to the veterans, including information on their military service (e.g., service branch, rank, years served) as well as military experiences identified as being potential predictors of body image and appearance-related outcomes in the previous qualitative study, detailed above. The PI advisory group gave feedback before the survey and study materials were finalised.

Six validated outcome measures were included in both versions of the survey in order to compare the body image and appearance-related experiences of the veterans and civilians:

- The Appearance Esteem subscale (10 items) of the Body Esteem Scale for Adults and Adolescents (BESA) (Mendelson, Mendelson & White, 2001) which assesses general feelings and satisfaction regarding appearance.
- The Body Image Life Disengagement Questionnaire (BILD-Q; Atkinson & Diedrichs, 2021) which measures the wider impact of appearance-related worries on various life domains.
- The Fear of Negative Appearance Evaluation Scale (FNAES; Lundgren, Anderson & Thompson, 2004) assessed the degree to which participants are concerned that others will evaluate them negatively based on their appearance.
- Two measures of social anxiety using two sub-scales from The Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998):
    - social avoidance and distress in new situations (SAS-new)
    - social avoidance and distress in general (SAS-general).
- The Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer & Williams, 2001) measures symptoms of depression across each of the nine Diagnostic and Statistical Manual (DSM) criteria for depression.

In addition, exploratory variables included eight validated measures and 12 non-validated items (questions created by the UNITS research team), identified as potentially being associated with appearance and body image experiences in the qualitative studies (see above). The wording of some items on these scales was modified, where necessary, to be suitable for AAI:

- The Body Image Acceptance and Action Questionnaire-5 (BIAAQ-5; Basarkod, Sahdra, & Ciarrochi, 2017) to measure body image flexibility.
- The Appearance Fixing sub-scale of the Body Image Coping Strategies Inventory (BICSI-AF; Cash, Santos, & Williams, 2005) to measure the degree to which participants attempt to cover, camouflage, correct, seek reassurance, and engage in social comparison regarding the aspect(s) of their appearance that concerns(s) them.
- The Perceived Stigmatisation Questionnaire (PSQ; Lawrence, Fauerbach, Heinberg, Doctor, & Thombs, 2006) to measure stigmatisation behaviours commonly experienced by people with a visible difference.
- Self-compassion was measured used the Short Form of the Self Compassion Scale (SCS-SF; Raes, Pommier, Neff, & Gucht, 2011) which assesses six components of self-compassion.
- The Engagement in Meaningful Activities Survey (EMAS; Eakman, 2012) assesses positive subjective experiences associated with day-to-day activities such as meaningful occupations.
- The Life Orientation Test – Revised (LOT-R; Glaesmer et al, 2012) is a measure of dispositional optimism.

- Multidimensional Scale of Perceived Support (MSPSS) is a measure of subjectively assessed social support across three areas (family, friends, and significant others) (Zimet, Powell, Farley, Werkman, & Berkoff, 1990).
- The Posttraumatic Stress Disorder (PTSD) items from the International Trauma Questionnaire (ITQ; Cloitre et al., 2018).

The non-validated items included six veteran-specific items:

- "I was expecting to be injured" (a 6-point ordinal scale)
- "Being seen as an injured veteran is a good thing" (a 5-point ordinal scale)
- "Having other veterans close by who are recovering from similar injuries and changes to their appearance has been helpful" (a 5-point ordinal scale)
- which operational deployment the individual was injured on e.g. Afghanistan
- "I would not feel comfortable talking about my altered appearance following my injury while in a military environment" (a 6-point ordinal scale)
- Whether the injury was sustained whilst on deployment or in training (a binary response: Yes/No);

and six items common to both the veteran and civilian samples:

- Number of years since injury
- "Being physically fit is important to me" (a 6-point ordinal scale)
- "I tend to say to myself "it could have been worse"" (a binary response: Yes/No)
- "I feel disgust when I think about or look at my appearance / body" (a 5-point ordinal scale)
- "I use humour to defuse awkward conversations about my injury and/or altered appearance" (a 4-point ordinal scale)
- "How noticeable do you think your scars/limb loss are to other people when you are fully clothed?" (an 11-point ordinal scale).

The survey was hosted on the secure online platform "Qualtrics". Respondents were eligible for inclusion in a draw to win up to £100 in online shopping vouchers. Participants were recruited through relevant support organisations, NHS services, the CASEVAC club, social media, CAR's participant pool, and traditional media.

Results

A total sample of 318 eligible participants (121 veterans and 197 civilians) completed the survey (details in Table 3).

Table 3: Demographics of the sample completing the online survey

Gender	**Veterans n (%)**	**Civilians n (%)**
Male	113 (93.4)	119 (60.1)
Female	8 (6.6)	77(38.9)
Prefer to self-describe	0 (0.0)	1 (0.5)
Prefer not to say	0 (0.0)	1 (0.5)
Ethnicity		
Asian or Asian British	0 (0.0)	5 (2.5)
Black, African, Black British or Caribbean	1 (0.8)	3 (1.5)
Mixed or multiple ethnicities	0 (0.0)	9 (4.5)
White	117 (96.7)	173 (87.4)
Other ethnicity	0 (0.0)	4 (2.0)
Prefer not to say	3 (2.5)	4 (2.0)
Relationship Status		
Single	14 (11.6)	54 (27.3)
Relationship less than 6-months	3 (2.5)	4 (2.0)
Relationship more than 6-months	1 (0.8)	23 (11.6)

Living with partner	13 (10.7)	37 (18.7)
Married	77 (63.6)	70 (35.4)
Separated	8 (6.6)	3 (1.5)
Divorced	5 (4.1)	4 (2.0)
Widowed	0 (0.0)	3 (1.5)
Education		
GCSEs or less	42 (36.8)	30 (16.0)
A-levels or equivalent	29 (25.4)	33 (17.6)
Degree or equivalent	25 (21.9)	71 (37.8)
Postgraduate qualifications	18 (15.8)	54 (28.7)
Type of injury		
Scars	56 (46.3)	170 (85.9)
Limb-loss	1 (0.8)	0 (0.0)
Both limb-loss and scarring	64 (52.9)	26 (13.3)
Misshapen body part	0 (0.0)	2 (1.0)
Cause of injury		
Training accident	25 (20.7)	-
Accident on deployment	23 (19.0)	-
Enemy action on deployment	73 (60.3)	-
Accident/Explosion	-	29 (14.6)
Burns	-	31 (15.7)
Sport-related	-	58 (29.3)
Assault/Violent crime	-	16 (8.1)
Road traffic accident/Transport	-	64 (32.3)
Years since injury (mean; SD)	18.11 (11.68 SD)	8.02 (9.49 SD)
Range	2 – 32	1 – 48
Military characteristics		
Service Branch		-
Naval Services	16 (13.2)	-
Army	100 (82.6)	-
Royal Air Force	5 (4.1)	-
Rank		-
Other ranks	42 (34.7)	-
NCO	58 (47.9)	-
Officer	21 (17.4)	-
Engagement type		-
Regular	117 (98.3)	-
Reserve	2 (1.7)	-
Years served in the military (mean; SD)	13.31 (7.62 SD)	-
Range	2 – 32	-
Years served when injured (mean; SD)	7.53 (6.08 SD)	-
Range	0 – 28	-

Summary of results

See Tables 4 and 5 (below) for means (and standard deviations) for all measures, and mean differences between the two groups. Civilians and veterans reported similar experiences of living with an altered appearance. However, compared with civilians, veterans experienced significantly lower body image flexibility and were more likely to avoid social, recreational and vocational activities (life engagement) due to appearance-related concerns. They also experienced significantly greater depression and PTSD, and perceived more appearance-related stigmatising behaviours by others.

Table 4: Mean score and standard deviation of all measures for veteran and civilian samples

Measure	Veteran			Civilian		
	N	Mean	SD	N	Mean	SD
BESA (Body Esteem)	121	2.23	0.988	198	2.42	0.913
BILEQ (Body Image Life Engagement)	118	3.40	0.684	191	3.76	0.465
FNAE (Fear of Negative Appearance Evaluation)	118	13.28	6.674	189	14.03	6.607
SAS-new (Social Anxiety – new situations)	113	15.40	6.749	175	16.89	6.418
SAS-general (Social Anxiety – in general)	113	9.24	4.175	175	9.54	3.956
PHQ-9 (Depression)	113	9.35	7.457	174	7.05	6.004
BIAAQ (Body Image Acceptance & Action)	120	26.50	7.863	194	29.64	6.668
BICSI-AF (Body Image Coping-Appearance Fixing)	118	0.75	0.646	188	0.92	0.705
PSQ (Perceived Stigma)	114	2.14	0.516	180	1.89	0.479
SCS-SF (Self Compassion)	113	2.89	0.822	176	3.03	0.863
EMAS (Engagement in Meaningful Activities)	114	33.66	6.915	175	33.38	7.610
LOT-R (Dispositional Optimism)	113	12.25	5.336	174	12.89	5.117
MSPSS (Perceived Support)	110	58.61	18.358	169	61.40	16.421
ITQ (Post Traumatic Stress PTSD)	110	10.13	7.951	161	7.12	6.676

Table 5: Mean difference between veteran and civilian scores on all variables

Measure	Mean Difference	95% CI	p	Hedge's g	95% CI
BESA (Body Esteem)	-0.189	-0.408, 0.029	.089	-0.20	-0.34, 0.03
BILEQ (Body Image Life Engagement)	-0.361	-0.501, -0.220	<.001	-0.64	-0.88, -0.41
FNAE (Fear of Negative Appearance Evaluation)	-0.752	-2.289, 0.784	.336	-0.11	-0.34, 0.12
SAS-new (Social Anxiety – new situations)	-1.487	-3.062, 0.087	.064	-0.23	-0.46, 0.01
SAS-general (Social Anxiety – in general)	-0.304	-1.277, 0.669	.539	-0.07	-0.31, 0.16
PHQ-9 (Depression)	2.293	0.645, 3.942	.007	0.35	0.11, 0.59
BIAAQ (Body Image Acceptance & Action)	-3.139	-4.840, -1.439	<.001	-0.46	-1.05, 0.12
BICSI-AF (Body Image Coping- Appearance Fixing)	-0.166	-0.320, -0.011	.036	-0.25	-0.48, -0.02
PSQ (Perceived Stigma)	0.256	0.137, 0.374	<.001	0.51	0.27, 0.74
SCS-SF (Self Compassion)	-0.143	-0.342, 0.056	.157	-0.16	-0.40, 0.07
EMAS (Engagement in Meaningful Activities)	0.281	-1.425, 1.987	.746	0.04	-0.20, 0.27
LOT-R (Dispositional Optimism)	-0.643	-1.893, 0.607	.312	-0.12	-0.36, 0.11
MSPSS (Perceived Support)	-2.787	-7.042, 1.467	.198	-0.16	-0.40, 0.08
ITQ (Post Traumatic Stress PTSD)	3.003	1.184, 4.822	.001	0.42	0.17, 0.66

Across both groups body image flexibility (BIAAQ), self-compassion (SCS-SF), engagement in meaningful activities (EMAS), optimism (LOT-R) and social support (MSPSS) were positively and significantly correlated with body esteem (BESA) and life engagement (BILEQ), and negatively and significantly correlated with fear of negative appearance evaluation (FNAE), social anxiety (SAS) and depression (PHQ-9). Appearance fixing, perceived stigma and PTSD were negatively and significantly correlated with body esteem and life engagement, and positively and significantly correlated with fear of negative appearance evaluation, social anxiety and depression (see Table 6).

Table 6: Pearson correlation coefficients for outcome variables with explanatory variables

	Veteran sample					
	BESA	BILEQ	FNAE	SAS-new	SAS-general	PHQ-9
BIAAQ	.732	.791	-.791	-.598	-.580	-.575
BICSI-AF	-.449	-.422	.662	.461	.329	.230
PSQ	-.425	-.456	.395	.354	.429	.332
SCS-SF	.599	.616	-.633	-.518	-.566	-.728
EMAS	.465	.396	-.268	-.311	-.358	-.437
LOT-R	.563	.625	-.566	-.526	-.509	-.672
MSPSS	.313	.418	-.289	-.238	-.346	-.449
ITQ	-.489	-.655	.603	.547	.516	.768

	Civilian sample					
	BESA	BILEQ	FNAE	SAS-new	SAS-general	PHQ-9
BIAAQ	.698	.741	-.716	-.458	-.491	-.601
BICSI-AF	-.570	-.276	.779	.454	.423	.366
PSQ	-.438	-.556	.501	.396	.433	.466
SCS-SF	.621	.366	-.655	-.645	-.594	-.664
EMAS	.468	.449	-.415	-.199	-.187	-.500
LOT-R	.533	.408	-.524	-.535	-.531	-.547
MSPSS	.255	.281	-.298	-.214	-.343	-.301
ITQ	-.508	-.532	.574	.444	.495	.628

For the veteran sample significance is achieved if: Absolute Correlations > .174 sig (alpha = .05), > .228 sig (alpha = .01), > .289 sig (alpha = .001) two-sided
For the civilian sample significance is achieved if: Absolute Correlations > .159 sig (alpha = .05), > .208 sig (alpha = .01), > .264 sig (alpha = .001) two-sided
BESA (Body Esteem); BILEQ (Body Image Life Engagement); FNAE (Fear of Negative Appearance Evaluation); SAS-new (Social Anxiety – new situations); SAS-general (Social Anxiety – in general);
PHQ-9 (Depression); BIAAQ (Body Image Acceptance & Action); BICSI-AF (Body Image Coping- Appearance Fixing); PSQ (Perceived Stigma); SCS-SF (Self Compassion); EMAS (Engagement in Meaningful Activities); LOT-R (Dispositional Optimism); MSPSS (Perceived Support); ITQ (Post Traumatic Stress PTSD)

Multiple regression analyses determined that body image flexibility (the capacity to non-judgementally experience difficult thoughts and feelings about the body while still engaging in value-driven activities), played the most significant role in predicting adjustment amongst both groups (see Table 7).

Table 7: Regression models for appearance outcome measures

	BESA (Body Esteem)					
	Veteran			Civilian		
	R^2 = .621, p < .001			R^2 = .628, p < .001		
Measure	Beta	t	p	Beta	t	p
BIAAQ	.593	5.828	<.001	.485	5.869	<.001
BICSI-AF	-.666	-0.858	.393	-.175	-2.783	.006
PSQ	-.002	-0.029	.977	.061	0.929	.355
SCS-SF	.007	0.062	.951	.186	2.403	.017
EMAS	.254	3.423	.001	.153	2.497	.014
LOT-R	.054	0.511	.611	.101	1.392	.166
MSPSS	.006	0.086	.932	-.044	-0.803	.423
ITQ	.003	0.036	.972	.054	0.758	.450

	BILEQ (Body Image Life Engagement)					
	Veteran			Civilian		
	R^2 = .691, p < .001			R^2 = .608, p < .001		
	Beta	t	p	Beta	t	p
BIAAQ	.552	5.986	<.001	.658	7.695	<.001
BICSI-AF	-.024	-0.344	.732	.151	2.333	.021
PSQ	-.021	-0.306	.760	-.190	-2.786	.006
SCS-SF	.005	0.056	.956	-.187	-2.358	.020
EMAS	.144	1.701	.092	.188	2.981	.003
LOT-R	.039	0.409	.683	.093	1.243	.216
MSPSS	.079	1.182	.240	.003	0.058	.954
ITQ	-.201	-2.299	.024	-.015	-0.015	.847

	FNAE (Fear of Negative Appearance Evaluation)					
	Veteran			Civilian		
	R^2 = .732, p < .001			R^2 = .782, p < .001		
	Beta	t	p	Beta	t	p
BIAAQ	-.450	-5.257	<.001	-.330	-5.211	<.001
BICSI – AF	.328	5.112	<.001	.464	9.630	<.001
PSQ	.022	0.347	.730	.019	0.382	.703
SCS-SF	-.131	-1.447	.151	-.179	-3.007	.003
EMAS	-.023	-0.363	.718	-.009	-0.186	.853
LOT-R	.038	0.429	.669	-.078	-1.402	.163
MSPSS	.005	0.085	.932	-.031	-0.725	.470
ITQ	.148	1.827	.071	-.005	-0.085	.933

BESA (Body Esteem); BILEQ (Body Image Life Engagement); FNAE (Fear of Negative Appearance Evaluation); SAS-new (Social Anxiety – new situations); SAS-general (Social Anxiety – in general);
PHQ-9 (Depression); BIAAQ (Body Image Acceptance & Action); BICSI-AF (Body Image Coping- Appearance Fixing); PSQ (Perceived Stigma); SCS-SF (Self Compassion); EMAS (Engagement in Meaningful Activities); LOT-R (Dispositional Optimism); MSPSS (Perceived Support); ITQ (Post Traumatic Stress PTSD)

For civilians and veterans, body image flexibility was strongly associated with all three appearance related outcomes (predicting higher body esteem and body image life engagement, and lower fear of negative appearance evaluation). Lower body image flexibility was also a significant, although not robust, predictor of heightened social anxiety and avoidance in general situations among veterans. While it is reasonable to assume that non-appearance related factors are likely to contribute to the increased incidence of PTSD and depression observed among veterans, worrying differences in appearance-related constructs suggest that they may also be more vulnerable to the impact of an altered appearance. Despite similarities in body esteem and fear of negative evaluation, increased tendency for lower body image flexibility, heightened perception of stigmatising behaviour by others and reduced life engagement are outcomes that indicate poor coping relative to similar others in the general population, and may even account for the stronger relationship between PTSD and depression among veterans. In addition, indication that self-compassion may be particularly useful to veterans to help them overcome appearance concerns related to social activities (life engagement) provided preliminary evidence that it may be beneficial to target this construct via intervention. For both groups lower self-compassion predicted depression and social anxiety in new situations.

Regarding support experiences and preferences, the survey found that ex-service and serving personnel with AAI want psychosocial support specifically tailored to their military experiences to help manage social stigma and numerous psychosocial difficulties related to their altered appearance. There was a stated preference for online support, with 51.4% of the veteran sample requesting it.

Conclusions

There are some similarities in the experiences of veterans and civilians living with an altered appearance due to injury. The findings of this study indicate the potential benefit of an intervention to promote body image flexibility to support veterans and serving personnel who are negatively impacted by AAI.

A paper on this study is being prepared for submission to the academic journal Body Image (see section 3).

iv) Intervention adaptation/development and acceptability testing

Aim

The studies detailed above highlighted a need for support for veterans with AAI, and that this support needs to be specific to the unique experiences of those whose altered appearance is a consequence of an injury sustained due to military circumstances. It is not sufficient or appropriate to suggest that resources developed for use by a civilian population should be made available to military veterans and serving personnel with AAIs.

Therefore, the aims of this part of the UNITS programme were to:

- determine the nature and content of interventions that would address the identified need for support that reflects the nuances in the experiences and needs of veterans
- gather acceptability data from key stakeholders.

Activity

The UNITS team reviewed the current provision of support for people affected by an altered appearance, in light of the findings from the studies outlined above. These discussions took place through a series of meetings in 2021, which included clinical psychologists from the UNITS research team (Dr James Kiff) and the UNITS Steering Committee (Dr Rachel Paskell) who contributed their extensive expertise and experience in the fields of psychological support for visible difference and the military, respectively.

These discussions led to an identified need for a stepped model of care with four levels of intervention:

Level 1 – Health Professionals Training

Level 2 – Psychoeducation and self-help materials

Level 3 – Group sessions with veterans

Level 4 – One-to-one therapy

Prototypes of new resources at levels 1 and 2 were then developed or adapted from those currently available for a civilian population (see below). Development of the complex interventions needed at levels 3 and 4 was beyond the scope and resources of the current grant.

Resources adapted and developed

ACT NOW for Veterans - a one-day training for health professionals working with serving personnel and veterans with AAIs was adapted from a civilian version (ACT NOW). This is based on the concepts and principles of Acceptance and Commitment Therapy (ACT). It uses a simplified ACT model to help professionals equip patients with knowledge and skills (mindfulness, thought defusion, values identification, self-compassion) to understand the cause of their psychosocial difficulties and enable them to engage in value-driven behaviour that facilitates a richer, fuller, and more meaningful life. The training also details the common psychosocial challenges faced by patients with AAI and ways professionals can sensitively raise and discuss the topic of appearance and explore any concerns. In addition, health professionals are provided with resources to share with patients on how to manage challenging social situations often experienced by those with an unusual appearance. A training day, led

by Dr Keeling and Dr Williamson, was facilitated in July 2021 and attended by six health professionals from four key military support organisations (Help for Heroes, Blesma, Combat Stress, and DMC Stanford Hall). Following this training day, an acceptability survey was completed by all attendees. This showed overall acceptability with some useful feedback such as extending the length of the training for those less familiar with some key psychological constructs, changing some language used, and ways to make it trauma informed. Having shown proof of concept, these materials now require adapting to a format that is easily accessible, for example online video format.

An Infographic was developed by the research team, based on the evidence generated from the UNITS studies to date. This is intended for people who may work with, support, or come in to contact with serving personnel and veterans with AAIs, with the purpose of raising awareness that some personnel and veterans with AAI may experience psychological distress and/or social challenges related to their appearance and suggests ways to provide support. It was acceptability tested with 14 stakeholders and four veterans with lived experience of AAI. Overall, acceptability was high, but with some helpful comments and suggested edits which have been integrated into the final version of this resource (see Appendix 3). This has been disseminated to attendees at the UNITS webinar hosted in November 2021 (see below) and is now being disseminated and promoted more widely.

An assessment tool to help identify those military personnel and veterans who may be experiencing appearance related difficulties and distress and might benefit from support was developed in two formats; a brief four question assessment tool in the style of a conversation starter, and a three question version eliciting yes/no responses. Both versions have been acceptability tested with 14 stakeholders and four PI advisors with high acceptability of both, and overall agreement that both versions should be available to suit the different needs of those in various roles who work with serving personnel and veterans. However, it will not be made available until interventions and resources that could benefit those identified as needing support have been fully developed and shown to be effective in future evaluation studies.

A psycho-education/self-help resource: "Managing others and difficult social situations: A guide for military personnel and veterans with appearance-altering injuries". This was based on material originally developed for civilians, adapted to suit serving personnel and veterans. The adaptation process included turning the material into a booklet with relevant images, inclusion of particular challenges identified in the interview studies as being pertinent to military populations with AAIs, and adjusting the language used. This resource is intended to help military populations with AAIs to develop skills to manage difficult social situations, such as staring and unsolicited questioning from the public (the most commonly reported appearance-related challenge reported in the qualitative study). It was acceptability tested with 14 stakeholders and four PPI advisors with an overall positive response and high acceptability, with some minor suggested edits which have been incorporated into the final version. Having shown proof of concept, this resource is ready to be fully evaluated before being made available for use (subject to evidence of effectiveness).

FUTURE WORK

This programme of work (referred to now as UNITS Phase 1) has identified the need for support for serving personnel and veterans with AAIs, and the value of taking an ACT-based approach to meet the needs of those who are experiencing psychological distress and social anxiety. It resulted in the creation of a range of prototype resources to start to fill the gap in the current provision of support. Evidence has been gathered of the acceptability of these resources from stakeholders (including veterans with lived experience of AAI, clinical advisors from DMRC Stanford Hall, Blesma, Help for Heroes, OP Courage, Combat Stress, and the Salisbury War Injury Clinic), which has informed plans for future work to fully develop, evaluate and disseminate effective ACT-based interventions incorporating social skills training, to meet the support needs of military personnel and veterans affected by AAI.

The quantitative studies produced a wealth of rich data worthy of further analysis, specifically around support needs and preferences, the impact on the family following AAIs, and family support needs.

Further research is needed to explore family support needs in more depth, and to develop appropriate, acceptable and feasible interventions and resources to meet these needs.

The impact of AAIs on intimate relationships and the impact of genital injuries specifically warrant attention. They were a concern for many of the veterans and partners interviewed in this programme of research.

The experiences of children of military personnel with AAIs warrants attention. They were a concern for many of those interviewed in this programme of research.

COLLABORATIONS

This programme of work was conducted in collaboration with organisations and professionals working to support military personnel, veterans, and their families, including NHS services. We also greatly valued the input of the UNITS Advisory Group and Steering Committee who gave advice and guidance throughout.

Contacts with other military researchers during the course of this study has resulted in potential future collaborations. These have led to grant applications being submitted (details below).

We have represented the UNITS study at the Scar Free Foundation Centre for Conflict Wound Research (CfCWR RPMG) through regular attendance at Research Program Management Group meetings, submitting reports to the Group and updates to the CfCWR website as requested, and contributing to events hosted by the Centre (including visits to support funding applications submitted by The Scar Free Foundation, and The Scar Free Foundation seminar in May 2019).

PATIENT INPUT

From the outset, PI involvement has been at the heart of this programme of research. PI input shaped our initial funding application, including the UNITS study title and acronym. More than 160 serving and ex-serving military personnel, veterans, and family members took part in the current research, either by being interviewed or completing an online survey. Research team members (Dr Keeling and Research Associates) met with the Advisory Group members (four veterans with lived experience of conflict related AAI and two family members) regularly to ensure their opinions were incorporated into the design and conduct of these studies, the development of support materials and training resources, and dissemination activities.

A veteran with lived experience of AAI (Mr Simon Harmer) has been a very valuable and active member of the UNITS Steering Committee.

POTENTIAL/REALISED IMPACT

This programme of work has provided evidence of the need to provide specific support to meet the needs and preferences of military personnel and veterans affected by AAI. In addition, we have demonstrated interest in training for staff working within organisations providing support to veterans. The engagement and feedback from professionals and support organisations working with those affected is evidence of their interest and enthusiasm to address this current gap in their ability to provide this specialist support.

Further development of the training materials is needed to adapt them to an online accessible format. The online training materials and assessment tool based on UNITS Phase 1 then need to be

evaluated, and will then provide an opportunity for considerable impact. This work has the potential to improve the mental health and wellbeing of current and future ex-service and serving personnel with AAI. It could build organisations' capacity to deliver evidence-based rehabilitation, by providing an openly available evidence-based intervention to which they can signpost ex-service and serving personnel who may benefit.

However, further funding is needed to enable us to finalise, evaluate effectiveness and disseminate an easily accessible ACT-based interventions, which individuals could access directly or through regional, national and international support organisations. Funding is also needed to provide training to those working in this field.

Blesma, Help for Heroes, Op Courage, Veterans Trauma Network, Combat Stress, NHS Salisbury War Injury Clinic, and The Royal British Legion, were all actively engaged with UNITS Phase 1 and have provided letters of support for future research (UNITS Phase 2). We have also established connections with the Office of Veterans Affairs (OVA) and the Ministry of Defence (MoD). These connections will be developed further, in line with an Impact Plan, to ensure that evidence-based resources are widely implemented and accessible. Evidence of impact will be collected.

STEERING COMMITTEE

We held eight meetings with the UNITS Steering Committee, in-person and online. Membership of the committee is detailed in the Appendix 1. Their support and advice has been greatly valued throughout.

PROJECT OUTPUTS

Published paper:

Keeling, M., Williamson, H., Williams, V., Kiff, J. & Harcourt, D. (2021). Body image concerns and psychological wellbeing among injured combat veterans with scars and limb loss: A review of the literature, *Military Behavioural Health*. https://doi.org/10.1080/21635781.2020.1792013

Papers currently under review:

Keeling, M., Williamson, H, Williams, V. S., Kiff, J., Evans, S., Murphy, D., & Harcourt, D. (Accepted subject to minor revisions). Body image and psychosocial well-being among UK military personnel and veterans who sustained appearance-altering combat-injuries.

Papers in preparation:

Keeling, M., Harcourt, D., White, P., Evans, S., Williams, V., Kiff, J., & Williamson, H. (In Preparation). Body image and appearance distress among military veterans and civilians with an injury-related visible difference: A comparison study. For submission to Body Image.

Keeling, M., Williams, V., Harcourt, D., Kiff, J., & Williamson, H. (In Preparation). The experiences, appearance-related concerns and support needs of parents of injured veterans with an altered appearance. For submission to Military Behavioral Health.

Keeling, M., Harcourt, D., Williams, V., Kiff, J., & Williamson, H. (In Preparation). Adjusting to the changed appearance of a partner following combat-injury. The experiences of injured veteran's partners. For submission to Military Behavioral Health.

Conference presentations:

Keeling, M., Williamson, H., Williams, V., Kiff, J., Evans, S., White, P. & Harcourt, D. Understanding the psychosocial wellbeing and support needs of military personnel and veterans affected by appearance-

altering conflict wounds. Oral Presentation at the Canadian Institute for Military and Veteran Health Virtual Forum 2021. Online.

Keeling, M., Williamson, H., Williams., V., Kiff, J., Evans, S., & Harcourt, D. *Exploring the Psychosocial Impact of an Altered Appearance Among Combat Injured Veterans: Resilience, Coping and Support Needs*. Oral presentation at the British Psychological Society Division of Health Psychology Annual Conference 2021. Online.

Keeling, M, Williamson, H., Williams, V., Kiff, J., and Harcourt, D. *Combat Injuries and the psychosocial impact of living with an altered appearance among amputee and scarred veterans: Resilience, coping and support*. Poster presented at the American Psychological Association Convention 2020. Washington, D.C.

Keeling, M, Williamson, H., Williams, V., Kiff, J., and Harcourt, D. *Blast Injuries and the psychosocial adjustment to an altered appearance: How best to support the Armed Forces Community*. Presented at the Blast Injuries Conference 2019. Imperial College London, England.

Keeling, M, Williamson, H., Williams, V., Kiff, J., and Harcourt, D. *The Psychosocial impact of deployment-related injuries: How should we support military service personnel, veterans and their families?* Poster presented at the King's College London Veteran Mental Health Conference 2019. London, England.

Invited talks:

London Spinal Cord Injury Centre, Royal National Orthopaedic Hospital NHS Trust. Dissemination of the outcomes of UNITS and how they apply to clinical practice. Presented by Dr Heidi Williamson and Dr Mary Keeling. April 2022.

UWE, Undergraduate Psychology Year 3 Appearance and Embodiment Module: Appearance-altering conditions: A research example. Understanding psychosocial needs & interventions for the treatment of scarring (UNITS): The Psychosocial Impact of Conflict-related Disfigurement. Presented by Dr Mary keeling. December 2020.

University of California, Los Angeles (UCLA) Nathenson Family Resilience Centre and UCLA Division of Population Behavioural Health. UNITS Study: An Overview. Presented by Dr Mary Keeling. June 2019.

Scar Free Foundation. Invited presentation to The Headley Court Trust. Understanding psychosocial needs & interventions for the treatment of scarring (UNITS): The Psychosocial Impact of Conflict-related Disfigurement. Presented by Dr Mary keeling. November 2019.

Williamson, H. Scar Free Foundation Military Conflict Wound Symposium May 2019.

Scar Free Foundation. Invited presentation to the Childwich Trust. Understanding psychosocial needs & interventions for the treatment of scarring (UNITS): The Psychosocial Impact of Conflict-related Disfigurement. Presented by Dr Mary keeling. May 2019.

University of the West of England, Department of Health and Applied Sciences Away Day. UNITS Study: An Overview. Presented by Dr Mary Keeling. November 2018.

Dissemination events and media coverage:

In May 2020 the UNITS team were guests on an episode of the Appearance Matters Podcast on Armed Forces and Appearance Research. This episode was downloaded 2,109 times and was played in 50 countries (top five = UK, Australia, USA, Canada, Ireland).

In November 2021 we held a free online webinar to disseminate the findings of this study. This event, held on Zoom, included an introduction by Lieutenant General Nugee who described the impact of appearance-altering combat injuries as an important aspect of modern warfare, and therefore stressed the need to address how best to support those affected via the work of the UNITS project. The event attracted a live audience of 63 and 13 watched the recording, including military personnel and veterans, the general public, members of support organisations, NHS services, academic researchers, and

representatives from MoD and OVA. Feedback showed the event was extremely well received, with 100% of participants who completed an evaluation reporting a 'positive' impression of the event, several attendees stated that that had already shared what they had learnt from the event with colleagues and veterans with AAI who they work with, and many others stated they intended to share what they had learnt. Specifically, one attendee stated: "*I did not really consider what, if any, positive or negative impact amputation or AAI might have on our Members... I now feel able to engage in the conversation around this better and aim to share this with my colleagues.*" Another stated: "*It will enable me to share with individual cases that come in that research is being done and that there are positive outcomes for helping these individuals."*

The UNITS programme has attracted media attention and has been featured on BBC Radio 4's Today programme, Channel 5 news, British Forces TV and BBC Radio Wales. An editorial piece on UNITS appeared in PathFinder Magazine (August 2020) and in the Blesma Magazine (Autumn 2020).

The Units study Twitter account (@unitsstudy) has 299 followers.

DETAILS OF PROPOSED DISSEMINATION/PPI/ENGAGEMENT PLANS (INCLUDING OPEN ACCESS PUBLICATIONS).

Dissemination to date and forthcoming talks are detailed above.

We have endeavoured to make the findings of this research freely and easily accessible to as many people as possible. The dissemination event in November 2021 was a free webinar and papers are being published as Open Access wherever possible. The papers submitted to Military Psychology and Military Behavioural Health are covered by UWE's Open Access agreement with the publisher and will not incur a charge. The paper on the online survey is being submitted to Body Image, published by Elsevier which does not have agreements in place with Higher Education Institutions. Publishing in Body Image (a high impact international journal specialising exclusively in appearance and body image-related issues) will incur a fee of $3650 plus tax. If our submissions to these journals are not successful, we will submit them to BMJ Military Health, which is not covered by a UWE Open Access agreement and would incur a fee of £2500 plus VAT per paper.

ANY INTELLECTUAL PROPERTY ARISING.

The data generated in this programme of work is being disseminated through peer-reviewed journal publications and conferences. We are seeking open access publication where possible within the confines of available budgets, utilising UWE's agreements with publishers for open access fee waiver where possible.

We have shown proof of concept for a range of resources that need further development and evaluation before they can be made available.

USE OF RESULTS TO OTHER FUNDING BODIES OR FOR COLLABORATIONS. Not applicable.

YEAR BY YEAR LIST OF FUNDING LEVERAGED DUE TO SCAR FREE FOUNDATION FUNDING

2020 – 2021. *Combat Genital Injury in UK Male Military Personnel: A Pilot Study to Explore Psychosocial, Body (genital) Image and Sexual Health Concerns and Support Needs,* Centre for Appearance Research,

University of the West of England, Quality-Related Research (QR) Funds. Total award: £8,189. Awarded to Dr Mary Keeling.

2019 – 2020. *Military Conflict-Related Appearance-Altering Injuries and the Impact on the Romantic Relationships and Psychosocial Wellbeing of Iraq and Afghanistan Veterans,* University of the West of England Vice-Chancellors Early Career Researcher Development Award. Total award: £14,770. Awarded to Dr Mary Keeling.

FUTURE PLANS

An application has been submitted to the Forces in Mind Trust for funding to develop an ACT-based intervention consisting of a series of professionally developed videos, including social skills training, to support military personnel affected by AAI. These videos will be created with stakeholder input and will be evaluated with a two-arm waitlist control randomised control trial (RCT) to assess intervention effectiveness.

Funding applications to continue investigation into the specific impact of AAI on romantic relationships and the impact of genital injuries will be sought. In addition, funding applications to investigate the impact of AAI on veterans transitioning to civilian employment will also be sought.

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Keeling, M., Williamson, H., Williams, V., Kiff, J., & Harcourt, D. (2020). Body image concerns and psychological wellbeing among injured combat veterans with scars and limb loss: A review of the literature. *Military Behavioral Health*, *9*(1), 1–10.

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APPENDICES

Appendix 1: The UNITS Steering Committee membership:

- Dr Chris Pawson – Head of Psychology, UWE (Independent Chair of the Committee)
- Dr Issy Bray – Associate Head of Department for Research & Knowledge Exchange, Dept of Health & Social Sciences, UWE
- Ms Alex Crick, Consultant Plastic Surgeon, Salisbury NHS Foundation Trust
- Ms Sarah Evans – Research Associate, Centre for Appearance Research, UWE
- Prof Nicola Fear – Professor of Epidemiology, King's Centre for Military Health Research
- Prof Diana Harcourt – Co-Chief Investigator, Centre for Appearance Research, UWE
- Mr Simon Harmer - PI Military representative with lived experience of AAI
- Glen Haughton - Warrant Officer 1; Senior Enlisted Advisor to the Chiefs of Staff Committee
- Dr Nigel Hunt – Associate Professor, Division of Psychiatry and Applied Psychology, University of Nottingham
- Dr Mary Keeling – Senior Research Fellow, Centre for Appearance Research, UWE
- Dr James Kiff – Clinical Psychology Advisor, Centre for Appearance Research, UWE
- Mr Harry Palmer – Programme Coordinator, Veterans' Mental Health Research Programme, Forces in Mind Trust, Centre for Mental Health
- Dr Rachel Paskell – Clinical Psychologist, Avon and Wiltshire Mental Health Partnership NHS Trust
- Kirsteen Waller - Health Programme Manager, Forces in Mind Trust
- Dr Jo White - Senior Research Fellow, Public Involvement Team, UWE
- Ms Victoria Williams – Research Associate, Centre for Appearance Research, UWE
- Dr Heidi Williamson – Co-Chief Investigator, Centre for Appearance Research, UWE

Appendix 2: Copy of published paper

Keeling, M., Williamson, H., Williams, V., Kiff, J. & Harcourt, D. (2021). Body image concerns and psychological wellbeing among injured combat veterans with scars and limb loss: A review of the literature, *Military Behavioural Health*. https://doi.org/10.1080/21635781.2020.1792013

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REVIEW

Body Image Concerns and Psychological Wellbeing among Injured Combat Veterans with Scars and Limb Loss: A Review of the Literature

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ABSTRACT

A narrative literature review aimed to determine the nature and prevalence of body image and psychosocial concerns and associated support needs among veterans with combat-related appearance-altering injuries. A systematic approach to a narrative review included searching published and gray literature between September 2018 and January 2019 and again in November 2019. Four hundred and twenty-seven papers were retrieved and judged against the eligibility criteria. Four papers were considered eligible and relevant and included in the review. Limited research investigating body image and psychosocial concerns among combat veterans with an altered appearance exists. The four papers indicate that combat injured veterans may experience body image distress and symptoms of depression, anxiety, and social anxiety. Military culture may enable resilience. Additional research is required to determine the scope and nature of the psychosocial impact of appearance-altering injuries among combat injured veterans. Further research should identify support gaps and inform the development of evidence-based interventions where needed.

KEYWORDS

Body image; military veterans; combat veterans; combat injury; burns; limb loss; scars; physical scarring; disfigurement; resilience

Introduction

The nature of military combat activities means many personnel receive injuries that result in a change to appearance, such as scarring and limb loss. Since 2001, 1,645 US military personnel sustained battle-injury major limb amputations, including the loss of one or more limbs, the loss of one or more partial limbs, or the loss of one or more full or partial hand or foot (Fischer, 2015). Between 2003 and 2019, 333 UK military personnel received traumatic or surgical amputations due to injuries sustained during deployment in Iraq and Afghanistan (Ministry of Defence, 2019). Between March 2005 and March 2019, 10,100 UK military service and ex-service personnel were in receipt of Armed Forces Compensation due to 'injury, wounds and scarring' sustained during military service. However, it is not clear how many of the compensation injuries led to a change to appearance. Moreover, it is possible that these statistics do not include service members with relatively smaller changes to their appearance or whose appearance was affected but without significant impact on physical function. Although the exact prevalence of UK and US military service and ex-service personnel with appearance-altering combat injuries is not available, what evidence there is indicates there are likely a substantial number. With advances in military medicine, many military personnel have survived injuries that would have previously been fatal (Tanielian & Jaycox, 2008), but could have resulted in a change to appearance. Despite the increase in potentially appearance-altering injuries, the psychological impact of these visible injuries is rarely evaluated. To date, research investigating such injuries has focused on immediate and long-term medical care, rehabilitation, and psychological trauma. Investigation of the psychosocial impact of a changed appearance and any associated support needs among injured combat veterans is needed.

Research conducted with civilians indicates that living with an appearance that is different from 'the norm', such as amputations and scars, can present significant psychological and social challenges. These include a negative impact on body image, self-esteem, and confidence (Clarke et al., 2013; Lawrence et al., 2006; Rumsey & Harcourt, 2012) and feelings of anger and hostility (Blakeney et al., 2008). Many civilians

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with an altered appearance report difficulties managing the stigmatizing reactions and behaviors of others such as staring, inappropriate comments, avoidance and unsolicited questions (Martin et al., 2017; Rumsey & Harcourt, 2012). Concerns about the impact of appearance on the ability to establish and maintain intimate relationships have been reported by individuals who have sustained scars from burns or lost limbs (Geertzen et al., 2009; Mathias & Harcourt, 2014; Sharratt et al., 2018). These appearance-related concerns and their psychological impact, can lead to social avoidance and isolation for some, which is often associated with the distressing belief that they are being judged negatively because of how they look (Holzer et al., 2014; Levine et al., 2005). Of note, not everyone who experiences a change to appearance because of an injury is negatively affected. Many people manage well, could be thriving, and could have experienced personal growth. The likelihood of and extent to which individuals experience challenges associated with appearance is most likely influenced by individual psychosocial factors, rather than the type, location or extent of the altered appearance (Clarke et al., 2013).

Cultural factors are likely to influence how individuals who have sustained appearance-altering injuries make sense of their experience and adjust to looking different (Clarke et al., 2013). Demographics of particular groups such as age, gender, race, and peer influences are also likely to play a role. Appearance is often perceived differently in different cultures and among different demographic groups, such that for example, there might be a particular premium placed on appearance for women, or a particular ideal placed on how males should look (Clarke et al., 2013).

The military has its own culture characterized by masculine ideals and beliefs about physical and sexual prowess and an ethos of hardiness (Christian et al., 2009; Hockey, 1986; Mankayi, 2008). This could lead those who have sustained a combat injury that has resulted in a change to their physical appearance to reevaluate their sense of masculinity, which in turn could affect self-esteem, psychological wellbeing, and sexual and other relationships. However, evidence to support this deduction or any literature providing insights into how military service and ex-service personnel adjust to an altered appearance and to looking different following combat injuries appear limited.

Despite an established evidence base for the psychosocial impact of a visibly different appearance among civilians and the sizeable numbers of personnel sustaining appearance-altering injuries during military operations, there seems to be a dearth of research investigating the psychosocial impact of appearance-altering injuries among military service and ex-service personnel. Based on the nuanced nature of military culture, it would be naïve to assume that evidence taken from civilians would be directly translatable to military populations.

Although research with civilian populations indicates considerable similarity in the challenges facing people with an unusual appearance regardless of its cause or type (Rumsey & Harcourt, 2012), research with those who have sustained a burn injury indicates trauma symptoms are positively associated with appearance concerns (Shepherd, 2015). This highlights the importance of paying particular attention to appearance-related issues when supporting those whose appearance has been affected due to traumatic injuries.

Due to the differing cultural context of the military and the high probability that injuries are sustained under traumatic conditions, there is a clear need to understand what is known about the appearance-related concerns, psychological wellbeing, and support needs of military service and ex-service personnel affected by combat-related appearance-altering injuries. Such knowledge is necessary to determine if specific appearance-related support is needed and if so to inform the development and provision of appropriate and effective psychological interventions and support materials.

Aim

There appear to have not been any previous efforts to systematically search for and review existing literature focused on the psychosocial impact of having an altered appearance as a result of combat-related injury among military service and ex-service personnel. Since there appears to be limited existing literature this review aimed to address four broad questions:

1. What is the nature and prevalence of body image concerns and their intersection with psychosocial health concerns, among military service and ex-service personnel with combat-related appearance-altering injuries?
2. What, if any, are the support needs of military service and ex-service personnel, with combat-related appearance-altering injuries?
3. Are there modifiable psychological and social challenges that can be targeted in interventions to improve body image, promote body acceptance,

Table 1. Search terms included for each heading.

Injuries:
Amputee, amputation, "limb loss", mangled, physical, wound*, injur*, impair*, burn, blast, health, disability, trauma*, polytrauma, casualty
Military:
Military, "Armed Forces", combat, "national guard", "Air Force", RAF, Army, Navy, Marine, regular, reserv*, soldier, "service personnel", troop, serving, veteran*, "ex-service personnel"
Impact:
Impact, difficulties, adversities, vulnerabilities, adjustment, adjusting, cope, coping, resilience, "social engagement", psycho*, "psychological functioning", depression, anxiety, stress*, PTSD, Burden, needs
Appearance-altering:
Appearance, "visible difference", deform*, disfigur*, scar*, "abnormal appearance", "impaired appearance", "body image", embodiment, "body functionality"
Support:
Support, help, relief, service*, "service provision", respite, therapy, intervention, counseling, finance, financial, grant, relocat*, housing, modification, adaptation, employment, "military transition", "military to civilian transition", transition, resettlement, "help seeking"

and improve psychological health among this group?

4. What if any, are the future directions and recommendations for development of interventions for military service and ex-service personnel with combat-related appearance-altering injuries?

Method

A systematic approach to a narrative review of the literature was taken to address the four questions. An initial broad search indicated there would be limited literature and so a traditional systematic review was deemed unnecessary. The systematic approach to a narrative review of the literature included searching published and gray literature.

Information sources and search

Published papers were searched for using a systematic approach in BioMed Central, Cochrane Library, Google Scholar, Ovid, PubMed, PsycINFO, SAGE Journals, Science Direct, SpringerLink, Taylor & Francis, Web of Science, and Wiley Online. The search was conducted using the keywords 'Injuries', 'Military', 'Impact', 'Appearance-altering' 'Support' (Table 1).

The search was run between September 2018 and January 2019 and re-run in November 2019. Table 2 provides details of the combinations of search terms used. Reference lists of eligible papers were hand searched and forward citation tracking of included articles were conducted using Google Scholar. Gray literature was sought through Google searches of relevant government and policy documents, and by contacting key experts in the military and appearance research fields.

Table 2. Search term combinations.

[Injuries] AND [Military] AND [Impact]
[Injuries] AND [Appearance-altering] AND [Military]
[Injuries] AND [Appearance-altering] AND [Military] AND [Impact]
[Injuries] AND [Appearance-altering] AND [Military] AND [Support]
[Injuries] AND [Appearance-altering] AND [Military] AND [Impact] AND [Support]

Eligibility criteria

Papers were eligible for inclusion if they were peer-reviewed and published in English. Due to the expected small numbers of papers, case reports, conference proceedings, editorials, literature reviews, qualitative and quantitative studies were included. Studies with samples of currently serving and ex-service regular or reserve personnel, and their families, who sustained appearance-altering, combat-related injuries any time since 1969 (the start of conflicts in Northern Ireland) to present day were included. Studies including samples of military service and ex-service personnel from any country were eligible as long as the paper was written in English. Studies which did not identify injuries as being appearance-altering and combat-related were excluded from the review.

Screening strategy

Study titles and abstracts were screened and included for a full-article review if they initially appeared to meet the eligibility criteria but had information missing. All records were managed using Mendeley© v1.17.13 software. All included papers were considered in terms of quality, such as design and sample size, however studies were not excluded for these reasons.

Results

Overview of papers

A total of 427 papers were retrieved from the search of the databases and contact with key stakeholders. The gray literature search and contact with key experts did not identify any additional papers. As shown in Figure 1, from study title and abstract screening, 10 papers were read in full and judged against the eligibility criteria. Four articles were deemed eligible and were included in this review. Of the four papers, three reported research carried out in the US, and one reported research conducted in Turkey. All of the papers focused on military

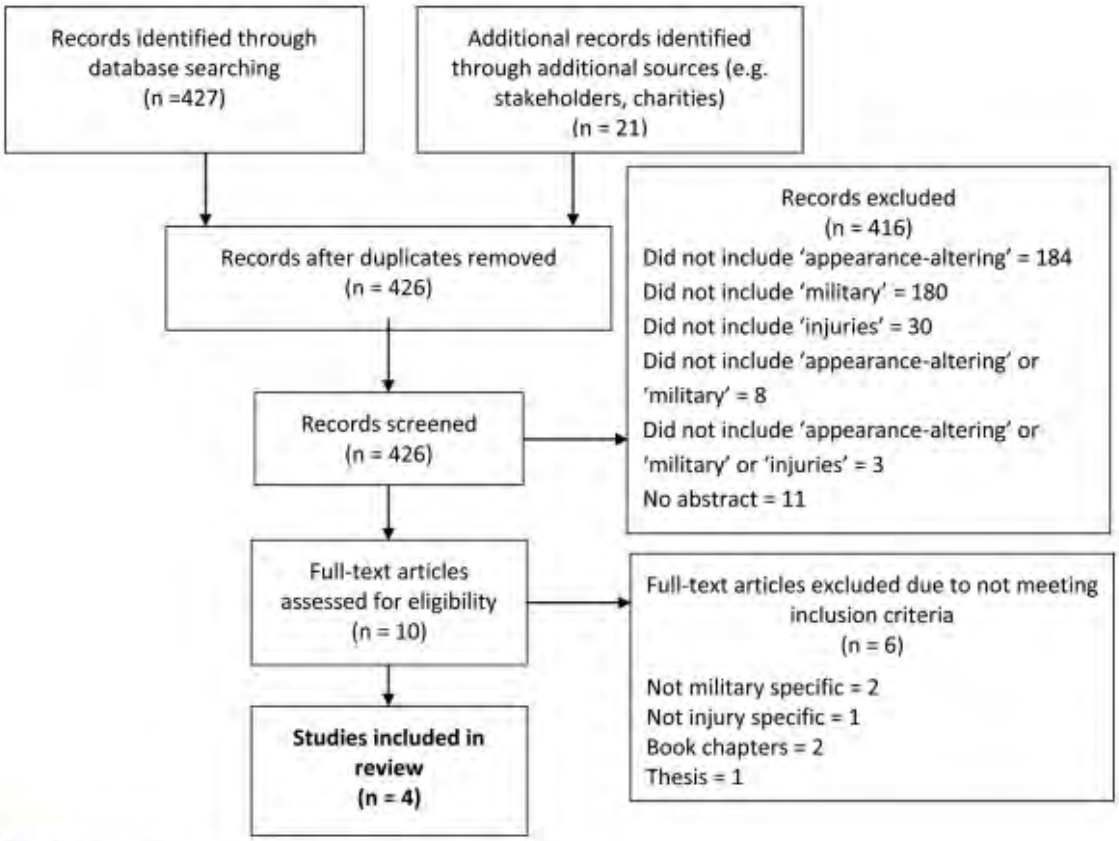

Figure 1. Screening process flow diagram.

populations including reserve and regular forces. One paper (Cater, 2012) included only women, two (Akyol et al., 2013; Messinger, 2009) included only men, and one (Weaver et al., 2014) included both men and women, with a male majority. One paper included participants with lower limb amputation only (Akyol et al., 2013), one included participants with both upper and lower limb amputation (Cater, 2012), one included participants with upper limb amputation only (Messinger, 2009), and one involved participants with a range of 'appearance-related residual injuries' including scars, marks, and functional impairments such as paralysis (Weaver et al., 2014). The papers were published between 2009 and 2014 but included service and ex-service personnel from combat eras including Vietnam (US involvement 1965 – 1975) through to the recent conflicts in Iraq (2003) and Afghanistan (2001). Two of the papers did not state the years of data collection, one of the papers collected data between January and March 2010 (Akyol et al., 2013), and another included participants who had been part of larger study that was conducted between 2006 and 2008 (Messinger, 2009). Two of the studies used cross-sectional quantitative designs and two used qualitative designs. The sample sizes of the qualitative studies ranged from n = 2 to n = 6 and the sample sizes of the quantitative studies ranged from n = 60 to n = 91 (Table 3).

The papers were reviewed (by two of the authors, anonymized for review), in consideration of the four research questions drawing out evidence from the papers that addressed each of the questions. The results from this narrative review are presented in response to each question.

What is the nature and prevalence of psychosocial and body image concerns among military service and ex-service personnel with combat-related appearance-altering injuries?

Clear prevalence rates of psychosocial and body image concerns were not available in any of the four papers. The closest indication of prevalence was reported by Akyol et al. (2013) who found that compared to

Table 3. Overview of included papers.

Author(s)	Date	Title	Sample population and size	Study design	Main outcome/focus	Country
Akyol Tander, Goktepe, Safaz, Kuru & Tan	2013	Quality of life in patients with lower limb amputation: Does it affect post-amputation pain, functional status, emotional status, and perception of body image?	60 Military personnel: n = 30 with traumatic lower limb amputation undergoing rehabilitation in an inpatient amputee clinic at a military rehabilitation center. n = 30 male health control	Cross-sectional survey	Quality of life, depression, anxiety and body image	Turkey
Cater	2012	Traumatic amputation: Psychosocial adjustment of six Army women to loss of one or more limbs	6 Army/Army National Guard women 5 women had lost one or more limb in combat 1 woman served a tour of duty in Iraq with a prosthetic leg	Qualitative Phenomenological	Psychological adjustment following traumatic amputation	USA
Messinger	2009	Incorporating the prosthetic: Traumatic limb-loss rehabilitation and refigured military bodies	2 patients from Amputee Patient Care Program at Walter Reed Army Medical Center 1 Reservist 1 Active Duty Officer Both injured during combat deployments	Case Study Medical anthropological approach	Exploration of how patients with traumatic limb loss construct new post-injury bodies and social worlds focusing on their relationships with others.	USA
Weaver, Walter, Chard, & Bosch	2014	Residual Injury, Appearance-related concerns, symptoms of post-traumatic stress disorder, and depression within a treatment seeking veteran sample	91 veterans 83.5% male Service Era: Operation Enduring Freedom/ Operation Iraqi Freedom (34%) Persian Gulf (20.9%) Post-Vietnam (18.7%) Vietnam (26.4%)	Cross-sectional Diagnostic and psychosocial interview Self-report questionnaires	Clinician Administered PTSD Scale for DSM-IV (CAPS) PTSD Checklist – Stressor-Specific Version (PCL-S) Beck Depression Inventory (BDI-II) Dysmorphic Concerns Questionnaire (DCQ) Health Assessment questionnaire (presence, number, nature of appearance-related residual combat injuries, if visible when clothed	USA

healthy controls, those with lower limb amputations had significantly higher scores on the Beck Depression Inventory and the Beck Anxiety Inventory; a direct association between symptoms of depression, symptoms of anxiety and appearance concerns was not however reported.

The four papers provide some evidence of the nature of psychosocial and body image concerns. The two qualitative papers consistently found evidence for increased self-consciousness related to appearance among their samples of six female (Cater, 2012) and two male (Messinger, 2009) amputees. Adjusting the internal image of how they look to match the reality of their bodies post injury, was reported as challenging for one of the two male veterans in Messinger's (2009) case study and for some of the female veterans in Cater's (2012) phenomenological study.

Both Messinger (2009) and Cater (2012) report evidence that appearance-related concerns affect social relationships. One of the veterans in Messinger's (2009) study reported social avoidance and isolation due to body image concerns. Among the female veterans in Cater's (2012) research was a concern that their friends may no longer want to associate with them and many were concerned about public stigma, especially among those with an upper limb amputation. Messinger (2009) reports that the two veterans in his study experienced anger and problems sleeping. However, it is unclear if these were related to appearance and body distress.

Of note, in Messinger's (2009) study, while evidence of appearance-related concerns was evident in each of the two veterans' cases, these are not included in the discussion of the results. Thus, while appearance concerns were evident, they were not a focal point of the paper. This is interesting since the conclusion of this paper draws on the fact that the amputee rehabilitation program's primary focus on physical rehabilitation misses the important role of psychosocial issues in recovery.

The two quantitative papers provide consistent evidence for a positive association between body image distress and symptoms of depression (Akyol et al., 2013; Weaver et al., 2014). An association between increased body image distress and Post Traumatic Stress Disorder (PTSD) was not found (Weaver et al., 2014). Weaver et al. (2014) reported that 75% of their sample met diagnostic criteria for PTSD however, 59% of the index trauma was combat injury-related which could partially explain the lack of association between body image distress and PTSD. Akyol et al. (2013) found that those with a lower limb amputation reported lower quality of life compared to healthy controls and that increased body image distress was associated with lower quality of life.

The four studies provide evidence that body image distress is associated with symptoms of depression, as measured using the Beck Depression Inventory, among military personnel and veterans with combat-related appearance-altering injuries. Additional difficulties include reduced quality of life, anger, sleep problems, potential relationship difficulties, social avoidance and isolation, perceived stigma, and adjusting their internal representation of their self and body image.

What are the support needs of military service and ex-service personnel with combat-related appearance-altering injuries?

None of the papers directly reference or provide evidence of any support needs of military service and ex-service personnel with appearance-altering combat injuries. While none of the reviewed papers made specific recommendations about psychosocial support, deduction from the findings of those papers as stated above, indicates that support may be beneficial for those struggling with body image distress, reporting symptoms of depression, anxiety, and social anxiety, as well as for managing perceived stigma, and relationship challenges.

Messinger (2009) concludes that a range of psychosocial issues need to be considered during rehabilitation, although the nature of those issues are not specified and this conclusion is not specifically related to appearance-related concerns. In Cater's (2012) study, many of the female veterans believed that only another veteran amputee could understand their life experience. This may have implications for the provision of services delivered by health professionals lacking military experience.

Are there modifiable psychological and social challenges that can be targeted in interventions to improve body image, promote body acceptance, and improve psychological health among this group?

Symptoms of depression, as measured using the Beck Depression Inventory, among veterans with appearance-altering injuries were reported in the two quantitative studies. Moreover, in both studies, reported symptoms of depression were associated with body image distress. Therefore, interventions targeting the

reduction of body image distress could be effective in reducing reported symptoms of depression. Investigation of what might influence body image distress was not included in either of the quantitative studies, thus not providing evidence of what could usefully be targeted in interventions. The two qualitative studies however, do highlight some specific experiences and challenges that might be associated with body image distress and that could be targeted in interventions.

As described above, Cater's (2012) and Messinger's (2009) studies report that adjusting their internal representation of their body and their appearance following an injury can be challenging for some veterans. An intervention targeting this process could be beneficial to support injured veterans in the process of accepting their post-injury appearance. The female veterans in Cater's (2012) study reported that while the adjustment of their own internal self-image was difficult, they expressed greater concern about how other people viewed them. A similar experience was reported in Messinger's (2009) case studies of two male veterans. Thus, interventions aimed at managing perceived stigma and interactions with others could be useful.

Cater's (2012) study raised the important role of military culture in recovery. Specifically, how the ethos of hardiness and presence of role models who had been through similar experiences enabled resilience and perseverance when recovery was challenging. Drawing on their personal courage helped the female veterans when meeting strangers, meaning they did not avoid social situations but instead drew on the resilience they had grown to manage their diminished self-confidence. Cater (2012) also reports that many of the female veterans were proud to be seen with their prosthetics limbs and in some ways considered them a badge of honor representing their service to their country.

Having good social support, a positive outlook, and positively reframing the experience of their injury, enabled the female veterans in Cater's (2012) study to manage some of the appearance-related challenges they faced. Interventions that facilitate social support and enable positive reframing of their injury and its impact could help minimize appearance-related psychological distress.

Weaver et al. (2014) did not directly investigate any factors that might be associated with body image distress and/or reported symptoms of depression. However, they do allude to the veterans having 'distressing cognitions' that may impact their body image and psychological wellbeing. They highlight masculinity as a particular factor that could affect body image alongside identity more broadly and in the context of military culture. They also propose that scars could function as a reminder of the injury that may also affect body image distress. Weaver et al. (2014) highlight these as important factors that could form the content of psychological interventions and that should be investigated in future research.

Three papers indicated that the nature of the injuries should be considered when planning interventions, especially function and physical recovery. Cater (2012), Messinger (2009) and Akyol et al. (2013) report that prosthetic use and physical function are closely connected to psychosocial wellbeing and appearance concerns. Akyol et al. (2013) also highlight the impact of pain in overall recovery and wellbeing, but not specific to appearance.

What if any, are the future directions and recommendations for development of interventions for military service and ex-service personnel with combat-related appearance-altering injuries??

Based on Cater (2012) and Weaver et al. (2014), military context and culture should be considered in future research and in the development of interventions to support members of the Armed Forces community affected by appearance-altering injuries. The findings that female veterans would prefer support to be provided by those with a lived experience and that recovery in the military culture enhances resilience (Cater, 2012) have implications for how and by who interventions should be delivered. As stated above, Weaver et al. (2014) make recommendations for future research to investigate cognitions about self and identity unique to the military, especially masculine identities, since these may be important factors associated with body image distress. Weaver et al. (2014) recommend future investigations to understand the impact on body image of scars that act as a reminder of the injury.

Messinger (2009) highlights the importance of considering the broader context of the injury in future research and interventions, mostly in terms of the control individuals felt over the conditions under which they were injured and their later treatment. As stated earlier, Messinger (2009) also highlights the focus on physical functioning in current recovery programs and a need to include a range of psychosocial issues, but does not specify these. Akyol et al. (2013) main recommendation is that the rehabilitation of

amputee veterans should focus on reducing symptoms of depression and anxiety, managing pain, improving body image and increasing locomotor activities; however, they do not suggest how this could be achieved.

Discussion

A review of the literature was conducted to establish what is currently understood about the psychosocial impact of appearance-altering combat injuries among military service and ex-service personnel. The review identified four eligible and relevant papers. Overall, the review indicates that combat veterans' experiences of a change to their appearance following combat injuries and the psychosocial impact this might have, is relatively unexplored. This is consistent with limited research about appearance-altering conditions and injuries found in other populations (Jenkinson et al., 2015).

The prevalence of psychosocial and body image concerns was unclear from the reviewed papers. Two papers provided evidence that combat veterans with appearance-altering injuries experienced symptoms of depression and body image distress and that the two are associated (Akyol et al., 2013; Weaver et al., 2014). The reviewed papers also provided evidence for other psychosocial and appearance-related distress experienced by combat injured veterans with a changed appearance that are consistent with those reported in the civilian literature. Increased self-consciousness, social avoidance and isolation, concerns about what others think and managing stigmatized reactions, anger, problems sleeping and problems with relationships, have been reported among individuals who have sustained scars from burns or lost limbs in the general population (Geertzen et al., 2009; Holzer et al., 2014; Mathias & Harcourt, 2014; Rumsey & Harcourt, 2012; Sharratt et al., 2018; Blakeney et al., 2008; Clarke et al., 2013).

This review did not identify research specific to the support needs or interventions that might benefit combat injured veterans with appearance concerns. It does indicate that combat injured veterans whose appearance has changed due to their injury, may need support with body image distress and possible associated symptoms of depression. In the civilian literature and clinical practice, CBT (Cognitive Behavioral Therapy)-based techniques inform much of the support offered by clinical psychologists and other psychosocial specialists to support individuals affected by an altered appearance (visible difference) (e.g. Clarke et al., 2013). Alternative approaches, such as interventions based on Acceptance and Commitment Therapy (ACT), are also being developed and tested for use with the general population with a visibly different appearance (Zucchelli et al., 2018). However, as the reviewed papers indicate cultural nuances within the military, interventions designed for the civilian population may not be appropriate for use with combat injured veterans; determining this requires specific research.

The reviewed qualitative papers indicate that combat injured veterans may also experience difficulties such as social anxiety, stigma, difficulty adjusting their internal representation of how they look, and frustration, problems sleeping and relationship difficulties. In the general population, lower intensity and self-directed resources such as online interventions (e.g. https://www.faceitonline.org.uk/), peer support or psycho-education have been developed to assist individuals to manage these kinds of appearance-related challenges (Rumsey & Harcourt, 2012).Further research is needed to examine whether these resources, or adapted versions, might also benefit combat injured veterans.

Consideration of the military culture is important for the development of interventions and resources. Cater (2012) highlighted a preference for support from those with a lived experience, the potential benefit of military peer support, how aspects of military culture such as an ethos of hardiness and perceiving limb loss and prosthetics as badges of honor, can help to build resilience. Weaver et al. (2014) highlights the need to consider the masculine context of the military, military-specific identities and the potential for scars to act as a reminder of the injury. These nuanced aspects of military culture could be harnessed in the development of support for combat injured veterans and should be considered by health care professionals working with combat injured veterans.

Implications and future directions

This review highlights a need for further research to specifically examine the role of the military context and culture in adjustment to an altered appearance after a combat injury, and the development of interventions and support. The relationships between prosthetic use and pain and their relation to appearance concerns should also be investigated in military populations. Since the reviewed papers were predominately from the US, with one from Turkey, there is a specific need for research with UK combat injured service and ex-service personnel whose appearance was affected

by their injuries. It is well documented in the literature that the experience of UK military personnel differs to the experiences of service personnel from other countries due to differences in ethos, training, deployment experiences, military medical services, and post-service medical services, for example access to Veterans Affairs services in the US. Future research should aim to: determine the scope and nature of any appearance specific problems; explore what, if any, appearance specific interventions or support are currently available in the UK and elsewhere, including any that are not evidence-based and have not been evaluated; and, examine the use of existing civilian interventions and the development of new military specific interventions to support combat injured veterans experiencing appearance-related distress.

Strengths and limitations

This is the first review aimed at understanding what is currently known about the psychosocial impact and support needs of combat injured military service and ex-service personnel with a change to their appearance due to their injury. This review adds to the literature highlighting an area of need for research to inform the development of tailored support and interventions for this specific group of combat veterans. There are however, limitations to this review such as the broad narrative approach rather than a more robust systematic review. However, based on the limited published research and the novelty of the topic, a narrative review was successful at identifying and synthesizing the existing knowledge in this relatively unexplored field.

The papers included in this review are from a predominantly US perspective and both the quantitative and qualitative studies had relatively small sample sizes. Therefore, the reviewed research is limited and not necessarily reflective of the experiences of combat injured veterans with an altered appearance per se. However, this also provides evidence and rationale for future research to understand the experiences of combat injured veterans with an altered appearance in the UK and other countries, using robust approaches.

Conclusion

This review indicates that despite a substantial number of combat injured veterans whose injuries have resulted in a change to their appearance, there is limited research aimed at understanding the psychosocial impact of a changed appearance and the related support needs of these combat veterans. The four reviewed papers provide evidence that combat injured veterans with an altered appearance can experience psychosocial challenges consistent with those experienced by civilians with a visible difference. However, the reviewed papers demonstrate military specific nuances suggesting there may be additional factors affecting injured combat veterans' psychosocial experience of their changed appearance. Therefore, the use of existing interventions and support materials for civilians may not be appropriate or effective for individuals whose appearance has changed as a result of a military combat injury. Research is needed to determine the scope and nature of the psychosocial impact of appearance-altering injuries among combat injured veterans and this should be used to inform the development and implementation of evidence-based interventions and support materials.

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Appendix 3: The Infographic

Appendix 4: Outline of the prototype training materials for those working with physically injured veterans

ACT Now for Veterans: Supporting psycho-social adjustment in veterans who have sustained injuries that affect their appearance	
Session 1	• The ACT Now training project • Tips for communicating with veterans about appearance • Common psychosocial difficulties relating to appearance-affecting injuries • Addressing myths about appearance concerns • Identifying veterans who are distressed • Introducing the ACT approach
Session 2	• Fixed attention and appearance anxiety • Having a conversation about appearance with veterans • Things to consider when supporting veterans • Using the 'ACT Map' with veterans
Session 3	• Introduction to mindfulness • Applying ACT's Helpful Skills to veterans: Mindful Breathing
Session 4	• Applying ACT's Helpful Skills: Thought de-fusion • Applying ACT's Helpful Skills: Valued action • Resources to help you and veterans • Review key learning points from the day