Predictors of Military Veterans’ Engagement in Bespoke Recovery Pathways and Health and Well-being Outcomes

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Abstract

Purpose/Objective: The objective of this cross-sectional study was to assess how psychosocial variables predict UK military veterans’ level of engagement in bespoke recovery pathways (Aim 1) and a sports-specific recovery pathway (Aim 2). A further purpose of this study was to test whether predictor variables indirectly predict outcome variables of physical health (Aim 3), mental health (Aim 4), and subjective vitality (Aim 5), when mediated through level of engagement with all recovery pathways and the sport recovery pathway.

Research Method/Design: A cross-sectional battery of questionnaires were completed by 514 military veterans who had been enrolled in Help for Heroes recovery pathways (e.g., sports recovery pathway) from three months-10 years. Data were analyzed by multinomial logistic and multiple linear regressions and mediation analyses using the PROCESS SPSS macro.

Results: Engagement in all recovery pathways (i.e., frequency and duration of attendance) was predicted by basic psychological needs frustration and perceived social support (Nagelkerke $R^2 = .16$). Sport-related social support ($p < .05$) and competence satisfaction ($p < .001$) were directly positively associated with mental health, and competence satisfaction with physical health ($p < .001$) and well-being ($p < .001$) on the sport recovery pathway. Whilst perceived stress was directly negatively associated with mental health and well-being ($p < .001$). Mediation analyses revealed no significant, indirect effects of psychosocial variables on health and wellbeing through level of engagement.

Conclusions/Implications: In sum, engagement in recovery pathways does not mediate the effects of psychosocial variables on veterans’ health and well-being. Perceived social support, satisfaction of veterans’ needs, and perceived stress were better predictors of health and well-being outcomes and should be an important focus of future research and recovery.

Keywords: motivation, need support, recovery pathway, social support, stress
**Impact and Implications Statement**

- Findings suggest that engagement in recovery pathways does not mediate the effects of psychosocial variables on veterans’ health and well-being.
- Perceived sport-related social support, stress, and competence satisfaction associated with recovery pathways predicted military veteran health and well-being.
- Future research should examine these recovery pathways longitudinally to determine whether these pathways are already effective for wounded, injured, and sick military veterans, or whether there are factors that could enhance these pathways’ effectiveness further.
- Initial implications from this cross-sectional study suggest that practitioners should develop programmes which reduce perceived stress, appeal to achievement motives, and encourage social support and the satisfaction of basic psychological needs.

There are approximately 2.5 million UK Armed Forces veterans living in the UK, of whom over 66,000 are estimated to require health-related support as a result of their previous military occupation (Diehle & Greenberg, 2015; Ministry of Defence, 2017). Military charities have typically supported wounded, injured, and sick (WIS) military veterans with their health and well-being post-Service. Supporting WIS military veterans in improving their health and well-being through their recovery journeys is a key driving factor of recovery services. Previous research has suggested that encouraging military veterans to positively engage with their own recovery journey is key to successful, long-term physical and mental health benefits following military service (Crawford et al., 2015; Warren et al., 2015). The military charity Help for Heroes (H4H) offers support through a range of activities and pathways. At the time of this study, the support on offer took the form of five bespoke recovery pathways which included, but were not limited to; career (e.g., access to courses),
psychological (e.g., counselling services), social (e.g., group-based peer support), financial support (e.g., grants), and the opportunity to be physically active through ‘sports recovery’ (e.g., adapted sports; “Get Support H4H”, 2018). These services are typically ‘open to all military veterans’ as they are designed to support the recovery of all WIS military veterans regardless of the wound, injury or illness that they experience. As these pathways are ‘self-referral’ in nature, there is no expectance around attendance and any level of engagement is considered a benefit to participants (“Get Support H4H”, 2018).

Within these services, engagement with sport and physical activity (PA) has repeatedly demonstrated numerous benefits. These include not only physiological benefits (e.g., improved physical fitness), but also psychological (e.g., self-confidence), and social (e.g., re-integration) benefits (Caddick & Smith, 2014; 2018; Shirazipour et al., 2018). The H4H ‘sports recovery’ pathway engages hundreds of military veterans every year through team sports, exercise, and training toward sport and exercise related qualifications (see “Get Support H4H”, 2018, for further information). For this reason, it is now considered by H4H as a key recovery pathway for WIS military veterans. As suggested by Shirazipour et al. (2018), despite the proliferation of sport and physical activity programs for military veterans, these programs have not been systematically examined to determine what strategies foster most benefits. Considering the prominence of the ‘sports recovery’ pathway at H4H, and the lack of research conducted on this bespoke pathway, it is important to assess military veterans’ use of and engagement with the sport-specific pathway.

Occupational psychology research has suggested that “engagement” refers to a positive, fulfilling, state of mind that is characterized by vigor, dedication, and absorption (Bakker & Demerouti, 2008; Weir et al., 2019). The intensity and nature of an individual’s engagement with health services (i.e., any service that supports improvement in or engagement with healthy behaviours) has been shown to positively impact on their health,
motivation, performance, and well-being (Britt & Bliese, 2003). There is currently limited research on the engagement of military veterans within a recovery context, with most research focused on the stigma associated with help-seeking behavior being a key barrier to engagement (Corrigan & Kleinlein, 2005; Mellotte et al., 2017). Research has not demonstrated whether level of engagement mediates the relationship between psychosocial factors (e.g., social support) and better health and well-being outcomes within a recovery context. These relationships may therefore be of importance when designing and implementing the content and length of recovery services offered.

Despite the multifaceted support offered by H4H, only one in four WIS military veterans who are eligible for the aforementioned support are engaging with the services offered (Diehle & Greenberg, 2015). The literature suggests that military veterans do not engage with bespoke recovery services due to multiple reasons which include; access to facilities (Mellotte et al., 2017; Whitworth & Ciccolo, 2016), feeling disconnected from services (Corrigan & Kleinlein, 2005; Mellotte et al., 2017), and stigma (Corrigan & Kleinlein, 2005). The aforementioned barriers are typically seen as preventing engagement, whilst military veterans also encounter a number of barriers that cease engagement (e.g., excessive paperwork, public stigma; Mellotte et al., 2017). Developing a more in-depth understanding of psychosocial barriers to engagement or to continued participation in bespoke recovery services, will be important to the development and uptake of recovery pathways for a wider pool of veterans. Therefore, it is pertinent to examine how potential barriers, perceived stress, motivation, and social support can determine military veterans’ engagement with bespoke recovery pathways designed to influence positive outcomes. This study will use H4H as a setting to explore determinants of engagement with recovery pathways (see Figure 1).
Research conducted with a broader military veteran population has identified a further potential barrier to engagement, perceived stress (Cohen et al., 2010). Perceived stress can be defined as, “the thoughts and feelings that an individual has about the demands they are currently experiencing or over a period of time” (Phillips, 2013). Extant literature in the field of business (Bakker & Demerouti, 2008) has demonstrated how increased stress can be linked to reduced engagement, due to factors including decreased motivation, lack of autonomy, and reduced perceived social support. The Bakker and Demerouti (2008) engagement model is applicable when examining engagement with recovery services. For example, the presence of stress (i.e., a demand) is believed to motivate people to disengage with healthy behaviors and engage in unhealthy, non-beneficial behaviors (e.g., not engaging with recovery) in order to bring them short-term pleasure or relief (i.e., an outcome; Ng & Jeffery, 2003). Indeed, military veterans who experience high levels of perceived stress have been found to decrease their participation in positive behaviors such as exercise, social interactions, and stress management (Ng & Jeffery, 2003). Therefore, the presence of stress in military veterans’ lives may negatively affect their level of engagement with recovery pathways as they seek alternative, short-term benefits or relief. The military psychology literature at present has neglected perceived stress in military veterans and predominantly focused on the stress-related experiences of those experiencing mental health issues such as anxiety, depression, and post-traumatic stress disorder (PTSD; Crawford et al., 2015; Sayer et al., 2009). To this end, it is of interest to study the effect of perceived stress on military veterans and their decision to engage with recovery pathways.

An additional factor that can be considered a determinant of engagement is an individual’s participation motives (Zahariadis & Biddle, 2000). Simply, these participation motives describe the reasons given by individuals for participating in activities, and cover motives including fun, social aspects, and skill development (Zahariadis & Biddle, 2000).
Further to this, understanding these motives could indicate an individual’s goal orientation and whether they have intrinsically or extrinsically motivated goals (Vansteenkiste & Ryan, 2013). The application of these motives to WIS military veterans could be of interest to researchers and practitioners alike, as understanding these motives could aid in the development of a more personalized approach to encourage engagement with and support maintenance of recovery.

Research examining physical activity adoption (Teixeira et al., 2012) has demonstrated, in line with self-determination theory (SDT; Deci & Ryan, 1985), that an individual’s basic psychological needs being supported has been consistently associated with increased engagement. Within SDT, adaptive forms of motivation are predicted to develop through the satisfaction of an individual’s three basic psychological needs of autonomy (feeling of being the origin of one’s behaviors), competence (feeling effective), and relatedness (feeling understood and cared for by others). Frustration of these needs can undermine motivation (Chen et al., 2015; Vansteenkiste & Ryan, 2013). It has been demonstrated in a meta-analysis applying SDT to health contexts that provision of need support (i.e. the inter-related nature of autonomy support, structure, and involvement) relates positively to physical and psychological health, and negatively to ill-being (Vansteenkiste & Ryan, 2013). Other research has demonstrated that if need frustration occurs, then this can elicit defensiveness and ill-being (Chen et al., 2015). The SDT framework could provide a useful means of exploring the factors predicting engagement in all recovery pathways, as each pathway is contributing to the holistic development and recovery of the individual. Consequently, it would be worth examining if veterans’ basic psychological needs are supported through the recovery pathways to indicate the likelihood of them developing adaptive forms of lasting motivation to engage with their recovery journeys and the associated positive health and well-being outcomes.
Previous research has suggested that in order to enhance motivation, increase engagement, and buffer against stress, social support is required (Romero et al., 2015; Wilcox, 2010). Social support is the perception and actuality that ‘one’ is cared for, has assistance available to them, and that ‘one’ is part of a supportive social network (Romero et al., 2015). Some studies suggest that social support could increase engagement because an individual’s support network ‘enables’ them to seek treatment when it is needed (Coleman et al., 2017). In contrast, other findings suggest that social support acts as a ‘buffer’ to mitigate the severity of physical and mental health issues, thus reducing the need for treatment (Wilcox, 2010). Although research demonstrates that military veterans benefit from social support (Coleman et al., 2017), little research has been conducted which examines the role of social support in predicting engagement of military veterans with bespoke recovery pathways.

The purpose of this study was to test a mediation model of engagement, predicted by psychosocial variables, on health and well-being outcomes in WIS military veterans. More specifically, the first aim was to assess how psychosocial variables (i.e., barriers, perceived stress, motives for participation, basic psychological needs, and perceived social support) predict UK military veterans’ level of engagement in bespoke recovery pathways provided by Help for Heroes (Aim 1; see Figure 1). The second aim was to determine whether psychosocial variables predict whether military veterans engage with the ‘sports recovery’ pathway (Aim 2; see Figure 1). The final aims consisted of whether predictor variables indirectly predict outcome variables of physical health (Aim 3), mental health (Aim 4), and subjective vitality (Aim 5; see Figure 1), mediated through level of engagement with all recovery pathways and the sport recovery pathway.

**Methods**

**Participants**
An a priori power analysis was conducted using G*Power3 (Faul et al., 2007) to test multiple regression using a medium effect size ($f^2 = .50$), and an alpha of .05. Results showed that a total sample of 495 participants was required to achieve a power of .80.

Any UK military veteran who had expressed an interest in engaging with H4H recovery pathways (i.e., a minimum requirement was for individuals to sign up to the H4H mailing list) was eligible to take part. The sample was drawn from an online database used by H4H ($N = 3,250$) and generated a 16% response rate (i.e., those who fully completed the survey). The final sample comprised 514 participants (419 males, 95 females; $M_{age} = 41.5 \pm 9.5$, age range 18-61), who had served in the British Army ($n = 337$), Royal Air Force ($n = 79$), Royal Navy ($n = 74$), or Royal Marines ($n = 24$), for a mean $\pm$ SD of 12.2 $\pm$ 7.2 years.

Participants reported their type of disability as: physical impairment ($n = 117$), mental health ($n = 69$), hearing impairment ($n = 1$), visual impairment ($n = 5$), cognitive impairment/brain injury ($n = 5$), or other ($n = 14$). The majority of participants reported co-morbidities ($n = 293$) with participants reporting having had their injury/impairment for an average of 11.7 $\pm$ 9.0 years.

**Procedures**

Following institutional and H4H ethical approval, participants were contacted via email. The initial communication provided them with an information sheet which gave further details of the study, informed participants of their ethical rights (e.g., confidentiality, right to withdraw, anonymity), and asked them to provide informed consent if they were willing to participate. A questionnaire pack was developed and piloted with ten UK veterans from diverse backgrounds including differing injury types, lengths of Service, and recovery experiences. No amendments were made following piloting. Each participant completed the questionnaire online at a single time point, over a period of 12 months between July 2016 and July 2017. The questionnaire pack took approximately 30-40 minutes to complete.
Participants were asked to respond to the questionnaires with their experiences of recovery in mind (e.g., H4H recovery pathways). Those who identified as ‘non-engagers’ were asked to reflect on the psychosocial variables in relation to their life and what was available to them at the time.

**Measures**

**Predictors.**

**Exercise Benefits/Barriers Scale (EBBS).** The 14-item barriers subscale of the EBBS (Sechrist et al., 1987) was used, rated on a four-point Likert scale ranging from 1 (**strongly disagree**) to 4 (**strongly agree**). Participants were asked to reflect on the statements presented in relation to their current participation with recovery services. Items represent three main potential barriers; Environment (e.g., “Facilities are inappropriate/inaccessible”), Expenditure (e.g., “I am fatigued by participating”), and Experiences (e.g., “I lack the confidence to participate”). Previous research has reported excellent internal consistency (mean \( \alpha = .90 \)) for the barrier subscale of the EBBS (Nelson & Gordon, 2003), with acceptable alpha values present in the current study (mean \( \alpha = .66 \)).

**Perceived Stress Scale (PSS).** The 14-item PSS (Cohen et al., 1983) was used to measure the degree to which situations in a military veteran’s life are appraised as stressful. For all items on the PSS, the stem “In the last month, how often have you...” was provided, to which the participants responded to each item (e.g., “been upset because of something that happened unexpectedly”) on a 5-point scale ranging from 0 (**never**) to 4 (**very often**). Previous research has reported excellent internal consistency (\( \alpha = .90 \)) and convergent validity for the PSS (Padden et al., 2011) with good alpha values present in the current study (\( \alpha = .80 \)).

**Participation Motivation Questionnaire (PMQ).** Participants completed the PMQ (Gill et al., 1983), which comprises 30-items covering possible reasons individuals have to participate in recovery. The items represent eight subscales: team orientation (e.g., “I like the
teamwork”), achievement/status (e.g., “I like the rewards”), fitness (e.g., “I want to stay in
shape”), friendship (e.g., “I like to meet new friends”), skill development (e.g., “I want to
improve my skills”), fun (e.g., “I like to have fun”), energy release (e.g., “I like to get out of
the house”), and miscellaneous (e.g., “I like to use the equipment or facilities”). Thinking
about their current reasons for participating in recovery (i.e., “I participate in the recovery
services because…”), participants responded to each item on a 5-point Likert scale ranging
from 1 (not at all important) to 5 (extremely important). Similar to previous studies
(Zahariadis & Biddle, 2000), the Cronbach’s alpha coefficients ranged from .81 to .94.

**Basic Psychological Need Satisfaction & Frustration Scale (BPNSFS).** The 24-
item BPNSNF scale (Chen et al., 2015) was designed to measure the three psychological
needs of autonomy, competence, and relatedness. Three of the subscales measure
participants’ experiences of satisfaction for autonomy (e.g., “a sense of choice and freedom in
the things I undertake”), competence (e.g., “confident that I can do things well”), and
relatedness (e.g., “close and connected with other people who are important to me”). The
remaining three subscales measure the experiences of frustration for autonomy (e.g.,
“pressured to do too many things”), competence (e.g., “insecure about my abilities”), and
relatedness (“the relationships I have are just superficial”). The stem, “When thinking about
my current involvement in recovery services, I feel…” was provided to which participants
responded on a 5-point Likert scale, ranging from 1 (Not at all true of me) to 5 (Very true of
me). Similar to previous evidence (Chen et al., 2015), the Cronbach’s alphas range between
.91 and .94 for satisfaction subscales and .83 and .91 for the frustration subscales in this
study.

**The Perceived Available Support in Sport Questionnaire (PASS-Q).** The PASS-Q
(Freeman et al., 2011) is a 16-item measure of the four dimensions of sport-related social
support. For all items on the PASS-Q participants were asked to reflect on their current
involvement with their recovery and the stem “If needed, to what extent would someone…”,
was provided to which participants responded on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely so). The four dimensions measured are emotional (e.g., “Always be there for you”), esteem (e.g., “Reinforce the positives”), informational (e.g., “Give you constructive criticism”), and tangible (e.g., “Help you with tasks to leave you free to concentrate”) support. Previous research has reported excellent reliability for the PASS-Q (α = .89; Freeman et al., 2011) with good alpha values present in the current study (α = .93).

Outcomes.

The U.K. Short Form 12 Health Survey Questionnaire (UK SF-12). The SF-12 (Ware et al., 1995) is a multidimensional generic measure of health-related quality of life. It has become widely used in clinical trials and routine outcome assessment because of its brevity and psychometric performance (Jenkinson & Layre, 1997; Ware et al., 1995). Participants were asked to reflect back on the previous four-weeks. Perceived physical health was measured using eight items such as, “In general, would you say your health is…” to which participants responded on a 5-point Likert scale ranging from 1 (Poor) to 5 (Excellent). Perceived mental health was assessed by four items (e.g., “Have you felt calm and peaceful?”) which participants responded to on a 6-point Likert scale, ranging from 1 (All of the time) to 5 (None of the time). Items were recorded so that higher scores reflect better health status.

Subjective Vitality Scale (SVS). Vitality is considered an aspect of eudemonic well-being (Ryan & Deci, 2001), as being vital and energetic is part of what it means to be fully functioning and psychologically well. The SVS asked participants to consider how seven items (e.g., “I feel alive and vital”) applied to them at the time of completing the scale. Participants responded on a 7-point Likert scale, ranging from 1 (not at all) to 7 (very true). An excellent level of internal consistency (α = .92; Ryan & Frederick, 1997) for the SVS has
previously been demonstrated, whilst this study demonstrated acceptable levels ($\alpha = .76$).

**Mediator.**

**Engagement with Help for Heroes (H4H) support.** As previously highlighted, the H4H recovery pathways are bespoke to the military veteran population and as such, no measure exists for engagement with these pathways. Therefore, participants reported their engagement through answering a number of attendance related questions that could indicate their level of engagement. Participants were asked to report whether they engaged with H4H, and if so, when they had first engaged with H4H. Participants then recorded whether they had attended any of the H4H recovery centers, their length of attendance, and how many times they would visit in a month. Participants also recorded whether they engaged with H4H recovery pathways, length of attendance on those pathways, and how often they engaged with the pathways in a month. Responses to these questions in particular highlighted participants who stated that they attended the ‘sports recovery’ pathway. Given the unique setting, H4H practitioners were then involved in the operationalization of the term ‘engagement’, with the following categories developed. Participants were then categorized into engagers and non-engagers (i.e., those who were not involved in, or associated with, H4H recovery pathways). Participants were then further split into non-, short-term (<6 months), long-term infrequent (>6 months but attended, on average, less than once a week), or long-term frequent (>6 months and attended, on average, more than once a week) engagers for further analysis. Similarly, participants were then categorized into engagers and non-engagers (with the ‘sports recovery’ pathway), as well as being further split into the aforementioned levels of engagement within the ‘sports recovery’ pathway. Long-term frequent and infrequent engagers were differentiated between by their average attendance on pathways per week. These two levels of engagement were split in such a way because long-term engagement, although viewed as desirable, may also raise issues of reintegration or dependency, which
may be further understood using this differentiation.

Data Analysis

Data were analyzed using SPSS software (IBM Corp, 2015). To answer Aims 1 and 2, two multinomial logistic regression analyses were run with level of engagement (i.e., non-, short-term-, long-term infrequent, or long-term frequent engager) used as the dependent variable, and predictor variables (i.e. barriers to engagement, perceived stress, basic psychological needs, motives for participation, and perceived social support) added simultaneously as independent variables. The reference group were those military veterans who did not engage with H4H or the ‘sports recovery’ pathway dependent on the analyses.

To facilitate the interpretation of differences between predictors, each predictor variable had been standardized to a mean of 0, and a standard deviation of 1.

Aims 3-5 were analyzed using multiple linear regression for each of three dependent outcome variables; self-reported physical health, mental health, and subjective vitality. The PROCESS SPSS macro was utilized to explore whether level of engagement mediated the effect of significant predictor variables on outcomes (Hayes, 2018). Specifically, direct, indirect, and total effects were measured to examine: (a) whether predictor variables were linked to outcome variables, and (b) whether engagement levels mediated the relationship between predictor variables and outcome variables. Bootstrapping was set at 1000 samples with bias-corrected 95% confidence intervals estimated for all effects (Hayes, 2018). An effect was considered significant when the confidence interval did not contain zero (Hayes, 2018).

Results

Descriptive group statistics are presented in Table 1. All measures demonstrated acceptable internal consistency (see Table 2).

<Table 1>
**Main Analyses**

Aim 1: In line with the first aim, when all predictor variables were included, the model significantly predicted engagement in H4H recovery pathways ($\chi^2 (51) = 76.73$, Nagelkerke $R^2 = .16$, $p < .01$). Significant unique contributions were made by competence frustration ($\chi^2 = 12.75$, $p < .01$) and perceived social support ($\chi^2 = 11.43$, $p < .01$). Post-hoc tests revealed that for each one-unit increase in competence frustration, the odds of being categorized as a long-term infrequent engager, compared to a non-engager, was decreased by .45. Furthermore, the odds of being categorized as a long-term frequent engager, compared to a non-engager, was increased by .47 for each one-unit increase in perceived social support (see Table 3 in supplementary materials for further detail).

Aim 2: In line with the second aim, when all predictor variables were included, the model significantly predicted engagement in the H4H ‘sport recovery’ pathway ($\chi^2 (51) = 67.90$, Nagelkerke $R^2 = .14$, $p < .05$). Significant unique contributions were made by competence ($\chi^2 = 11.38$, $p < .01$) and relatedness frustration ($\chi^2 = 10.18$, $p < .05$). Post-hoc tests revealed that for each one-unit increase in competence and relatedness frustration, the odds of being categorized as a long-term frequent engager, compared to a non-engager, was decreased by .74 and .80, respectively (see Table 3 in supplementary materials).

Aim 3: Predictor variables (barriers to engagement, perceived stress, participation motives, perceived social support, and basic psychological needs) explained 16% of the variance of veterans’ physical health ($F(17,496) = 5.56$, $p < .001$, $R^2 = .16$). Variables of ‘achievement/status’ participation motives ($b = 2.53$, $p < .001$) and competence satisfaction ($b = 3.05$, $p < .001$) were both independently positively predictive of perceived physical health. In comparison, relatedness satisfaction ($b = -2.64$, $p < .001$), ‘skill development’ ($b = -2.85$, $p < .001$), and ‘friendship’ participation motives ($b = -3.40$, $p < .01$) negatively predicted perceived physical health. No other variables contributed significantly to the model.
There were no significant indirect effects of the predictor variables on physical health through engagement levels (see Table 4a in supplementary materials), suggesting that the relationships between psychosocial variables and physical health outcomes were not mediated by engagement in all recovery pathways.

Aim 4: Predictor variables (barriers to engagement, perceived stress, participation motives, perceived social support, and basic psychological needs) significantly predicted veterans’ mental health ($F(17,496) = 17.34, p < .001, R^2 = .37$), explaining 37% of the variance. Perceived social support ($b = .99, p < .05$), ‘fun’ participation motives ($b = 2.90, p < .001$), and competence satisfaction ($b = 2.99, p < .001$) all displayed significant positive contributions to mental health. Perceived stress ($b = -.33, p < .001$), ‘achievement/status’ ($b = -1.58, p < .01$), ‘friendship’ participation motives ($b = -2.88, p < .01$), competence frustration ($b = -1.75, p < .01$) and relatedness frustration ($b = -1.51, p < .01$) all displayed significant negative contributions to mental health. Mediation results indicated that there were no significant indirect effects of the predictor variables, on mental health through engagement levels (see Table 4b in supplementary materials), suggesting that the relationships between the psychosocial variables and mental health outcomes were not mediated by engagement in all recovery pathways.

Aim 5: Predictor variables (barriers to engagement, perceived stress, participation motives, perceived social support, and basic psychological needs) explained 42% of the variance in veterans’ subjective vitality ($F(17,496) = 20.66, p < .001, R^2 = .42$). Variables of ‘fun’ ($b = 2.53, p < .001$) and ‘energy release’ ($b = 1.10, p < .05$) participation motives, as well as competence satisfaction ($b = 2.37, p < .001$) all displayed significant positive contributions to the model. Variables of perceived stress ($b = -.22, p < .001$), ‘skill development’ participation motives ($b = -1.04, p < .05$) and competence ($b = -.99, p < .05$) and relatedness ($b = -1.64, p < .001$) frustration all displayed significant negative
contributions to the model. No other predictor variables contributed significantly to the model. There were no significant indirect effects of the predictor variables on subjective vitality through level of engagement (see Table 4c in supplementary materials), suggesting that the relationships between the psychosocial variables and subjective vitality were not mediated by engagement in all recovery pathways.

**Discussion**

The present cross-sectional survey study aimed to test a mediation model of engagement, predicted by psychosocial variables, on health and well-being outcomes in a population of WIS military veterans engaged with bespoke national pathways of recovery (H4H). Competence frustration (i.e., feelings of failure or inadequacy, and doubts over one’s own abilities) appeared to be associated with poor engagement with all recovery pathways, and the sports recovery pathway in particular. Perceiving oneself to have social support appeared to be positively associated with participation on all recovery pathways, whilst frustration of the need for relatedness was associated with limited engagement with the sports recovery pathway specifically. Contrary to our suppositions, the association of predictive factors with outcome variables was not mediated by level of engagement in any case (i.e., across all recovery pathways).

In partial support of Aim 1, it was found that a combination of determinants (low competence frustration and higher perceived sport-related social support) predicted the level of engagement that military veterans had with H4H recovery pathways. Frustration of the need for competence occurs when a person feels the challenge set in a given setting is either beyond their capacity, or does not permit them to demonstrate their competence. It may be that competence is particularly pertinent to military veterans if, for example, tasks within a recovery pathway are comparable to what an individual used to be able to do (e.g., prior levels of physical performance), then that individual will likely experience competence
frustration because they will be comparing their current limitations with their former ability (Fortier et al., 2007; Vansteenkiste & Ryan, 2013). Potentially, this frustration may then lead individuals to disengage with recovery pathways as they feel as though they are not progressing. In contrast, these same individuals may be able to feel more competent if tasks are better matched to their current selves, and they are able to see progress, which in turn, will mean they are likely to remain engaged (Fortier et al., 2007; Vansteenkiste & Ryan, 2013). Ensuring that recovery service tasks are matched with individuals’ current abilities could aid veterans in feeling competent in their recovery and as though they are progressing.

The significance of competence frustration rather than satisfaction is also an interesting finding within this study. Research has typically found that active need support is a better predictor of behavior than the absence of need frustration (Vansteenkiste & Ryan, 2013). It has been argued that frustration of psychological needs, rather than fulfilment of them, can lead to maladaptive behaviors (e.g., not engaging in positive health behaviors; Bartholomew et al., 2011). This argument is made from the notion that lack of experienced need satisfaction does not necessarily imply active need frustration (Bartholomew et al., 2011). With military veterans engaging with recovery pathways, it may be argued that environments that actively thwart an individual’s competence (e.g., make individuals feel as though they cannot successfully complete difficult tasks) would reduce engagement with recovery. Therefore, the absence of need frustration (which if present would slow growth or develop maladaptive behaviors) offers military veterans the opportunity to adapt to and engage with recovery. A consideration for practitioners, therefore, could be to create an environment that reduces need frustration in the initial stages, before later emphasizing need satisfaction in order to promote growth in recovery (Vansteenkiste & Ryan, 2013).

As highlighted, perceived social support (i.e., emotional, esteem, informational, and tangible) was also positively associated with engagement. This supports previous research
(Coleman et al., 2017; Romero et al., 2015), as it appears that support from their surrounding network ‘enables’ veterans to engage in recovery pathways. Expanding upon these findings however, perceived social support was a significant predictor of long-term engagement with recovery pathways. It may be argued that long-term frequent engagers had the time to develop further social support networks within H4H, alongside their existing support networks, which may have meant they then remaining engaged in the long-term (Coleman et al., 2017). Therefore, future researchers should look to further explore the social support received by long-term frequent engagers, as this will further inform researchers and practitioners on the type and timing of social support that WIS military veterans require to engage over time with their recovery journeys.

Contrary to predictions, level of engagement did not mediate any associations between psychosocial and outcome variables. These findings contradict previous findings, which suggested that engagement with recovery programs could have positive effects on physical health, mental health, and aspects of well-being (Caddick & Smith, 2018; Warren et al., 2015). The findings of this research demonstrate that level of engagement in recovery pathways does not mediate the effects of psychosocial variables on veterans’ health and well-being. A potential explanation for this finding may be that veterans engage with their own recovery journey away from the recovery services setting, and only re-engage when they feel the need to. Furthermore, this finding on engagement may be partly explained by how this concept was measured; in the present study, participants were split in accordance with how long they had attended recovery pathways, alongside the frequency of their attendance per week to generate a calculation of engagement. There have been calls within the literature to move away from a length of engagement focus and rather focus on quality of engagement (Caddick & Smith, 2014; 2018). Future research should therefore examine the concept of engagement with a greater emphasis on the quality of the engagement experience.
Despite mediation not being found, positive (i.e., ‘achievement or status’ motives and competence satisfaction) associations between psychosocial variables and perceived physical health were found. Given the WIS military veteran population examined, when improvements in physical health are framed as a motive, individuals are likely to focus on physical aspects of recovery (Zahariadis & Biddle, 2000). This focus may ultimately lead to positive impacts upon physical health (e.g., increased functioning). This would offer support to ‘achievement/status’ motives being an independent, positive predictor of perceived physical health as demonstrated in this study. It can be suggested that military veterans who are wounded, injured, and sick are attempting to, through recovery, achieve their previous health status (Caddick & Smith, 2014; Warren et al., 2015). Framing improvements in physical health as a motive may be how these veterans initially motivate themselves to engage with the recovery process. Once involved with the process, these veterans are likely to see progression in their physical health due to the naturally increased levels of physical activity (Caddick & Smith, 2014; 2018; Shirazipour et al., 2018). Of further interest was the positive association of competence satisfaction to physical health. As suggested by previous research (Fortier et al., 2007; Teixeira et al., 2012) individuals who felt competent, may have been likely to feel enjoyment and interest, which could have led to them increasing their time and effort in improving their physical health.

Shifting the focus from predictors of physical health to mental health, this study demonstrates the importance of, and positive associations between, social support, competence satisfaction, and mental health and well-being in the context of a recovery pathway specifically designed for military veterans. A potential explanation for this finding could be that perceived social support and feelings of competence experienced by military veterans originate from course instructors and fellow participants on the pathway who share similar military backgrounds (Coleman et al., 2017). Although not measured in this study, the
shared identity of the military veterans (i.e., previous military occupation) engaged with H4H recovery pathways may be a protective factor, as military veterans see the recovery pathway as somewhere they feel comfortable in talking about or dealing with mental health (Romero et al., 2015); thus enhancing feelings of being supported and competent. It will be important moving forward to ensure these pathways maintain opportunities for social support and competence satisfaction to encourage military veterans to continue to work with and maintain their mental health and wellbeing. Considering the topicality of military veteran health (HM Government, 2018), a finding of concern was that perceived stress was negatively associated with mental health and wellbeing. This finding is in line with previous research, which shows that military veterans who perceive stress in relation to services are more likely to have anxiety, depression, or PTSD (Crawford et al., 2015; Sayer et al., 2009). It is, therefore, suggested that future research specifically explores the stress experiences of military veterans during their recovery (see, e.g., Roberts et al., 2019) so that, ultimately, practitioners are optimally equipped to ensure that recovery pathways are appropriately designed and tailored to help reduce and better manage the stress that is experienced.

**Strengths and Limitations**

A key strength of the current study was gaining access to a distinctive UK military veteran population, of whom some were engaging with organized recovery pathways. The main limitation of the study was the cross-sectional nature of the research as this only allowed for a snapshot of military veterans’ recovery processes. Consequently, future research could supplement the results of this study with a longitudinal cohort follow-up study, since this would help to examine the varying, and often complex relationships between engagement and health outcomes. Further to this, the findings from specific questionnaires need to be interpreted with caution. For example, the PASS-Q (Freeman et al., 2011) was developed to measure sport-related social support, and despite adaptations for the studied...
population, more recovery service specific questionnaires may have offered clearer insight into experiences of military veterans using these services. In addition, examining objective measures of health may further the methodology of this study in the future. Whilst an individually tailored measure of engagement was created for this study, future research should repeat testing the relationships examined with a validated engagement questionnaire. Another potential limitation is the homogeneity of the sample and the limited response rate (16%). With participants recruited from a H4H online database, the experiences of those who have never contacted H4H nor signed up to a recovery pathway may have been missed, as well as those individuals who did not respond to questionnaire. These individuals may provide greater insight into the factors or reasons that prevent individuals from engaging or even considering engagement, and offer a clearer idea of what could be done to ensure recovery pathways are accessible to all military veterans.

The findings of this cross-sectional study offer potential avenues for researchers to explore and practitioners to consider. Firstly, there were few distinct differences found between the H4H recovery pathways in general and the H4H ‘sports recovery’ pathway specifically. This suggests that these pathways require further, separate examination as each pathway may make their own unique contribution to military veterans’ recovery journeys. Secondly, the issue of engagement requires further consideration. Previous research suggests engagement to be beneficial (Britt & Bliese, 2003), yet engagement did not mediate findings in this study. The suggestion here is not to focus solely on engagement per se, but other important factors. For example, engagement may not have been predictive as individuals require different levels of support, and so reduced contact time (e.g., attending only once) may be enough to spur change in some instances. All of these are factors, plus a focus on the ‘quality’ of engagement, need to be considered by those involved with creating and tailoring programs and support within military veteran recovery contexts. It is also important for
practitioners and family members to remember that military veterans will engage with their recovery when they are ready to and that engagement should not be forced upon them. Thirdly, practitioners should ensure that particular psychosocial variables (e.g., basic psychological needs satisfaction) are nurtured within current military veteran recovery pathways. Environments should be supportive of veterans’ competence and avoid need frustration, with research endorsing the use of a combination of multiple co-acting techniques (e.g., providing informational feedback and ensuring there is a task climate; Gillison et al., 2019). Finally, considering the negative associations found between mental health, well-being, and perceived stress in this study, it will be pertinent for practitioners to consider integrating stress management interventions into military veterans’ recovery journeys (cf. Rumbold et al., 2018).

**Conclusions**

The results of the study suggest that engagement in recovery pathways does not mediate the effects of psychosocial variables on veterans’ health and well-being. In the present setting, perceived social support from significant others (as well as recovery services) and satisfaction of veterans’ need for competence were positively associated with health and well-being outcomes, whilst perceived stress was negatively associated with health and well-being outcomes. It can be argued therefore, that these factors should be an important focus of any recovery service. Future research should look to examine these recovery pathways and programs in greater detail and over a longer period of time. Further research in this area can support practitioners in encouraging greater quality of engagement with recovery pathways, as well as developing and implementing programs that are of greatest benefit to WIS military veterans.
References


Padden, D., Connors, R., & Agazio, J. (2011). Determinants of health-promoting behaviours
in military spouses during deployment separation. *Military Medicine, 176*, 26-34.


### Table 1

Demographic characteristics of all participants.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total Sample (N=514)</th>
<th>Level of Engagement in H4H</th>
<th>Level of Engagement in H4HSR</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>NE (n=56)</td>
<td>ST (n=17)</td>
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<tr>
<td>Age (years)</td>
<td>41.46 ± 9.53</td>
<td>40.34±9.27</td>
<td>37.47±11.80</td>
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<tr>
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<td>95</td>
<td>13</td>
<td>6</td>
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<tr>
<td>Military Branch</td>
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<td>Army</td>
<td>Royal Air Force</td>
</tr>
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<td></td>
<td>335</td>
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<td>1</td>
<td>0</td>
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<tr>
<td>Length of Service (years)</td>
<td>12.18 ± 7.19</td>
<td>10.61±5.76</td>
<td>11.03±8.00</td>
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<td>Disability/Impairment</td>
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<td>37</td>
<td>9</td>
</tr>
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<td></td>
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<td>14</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>69</td>
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<td>0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Disability/Impairment (years)</td>
<td>11.35 ± 8.00</td>
<td>12.00±7.91</td>
<td>10.73±9.72</td>
</tr>
</tbody>
</table>

*Note.* H4H = Help for Heroes; H4HSR = Help for Heroes ‘Sports Recovery’ Pathway; NE = Non-engagers; ST = Short-term Engagers; LT-I = Long-term Infrequent Engagers; LT-F = Long-term Frequent Engagers.
Table 2

Means and standard deviations of all psychosocial variables for all participants.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total Sample (N=514)</th>
<th>Cronbach Alphas</th>
<th>Level of Engagement in H4H</th>
<th>Level of Engagement in H4HSR</th>
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</thead>
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<tr>
<td></td>
<td></td>
<td>(α)</td>
<td>NE</td>
<td>ST</td>
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<tr>
<td>Barriers</td>
<td>24.45±5.59</td>
<td>.66</td>
<td>24.79±5.67</td>
<td>24.18±4.77</td>
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<td>Part. Motivation</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Team Orientation</td>
<td>3.84±1.02</td>
<td>.94</td>
<td>4.04±0.80</td>
<td>4.00±0.91</td>
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<tr>
<td>Achievement/Status</td>
<td>3.12±0.99</td>
<td>.89</td>
<td>3.24±0.92</td>
<td>3.06±1.06</td>
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<tr>
<td>Fitness</td>
<td>4.06±0.90</td>
<td>.92</td>
<td>4.04±0.80</td>
<td>4.00±1.08</td>
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<tr>
<td>Friendship</td>
<td>3.74±0.86</td>
<td>.82</td>
<td>3.92±0.77</td>
<td>3.75±0.73</td>
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<tr>
<td>Skill Development</td>
<td>3.89±0.95</td>
<td>.86</td>
<td>4.00±0.82</td>
<td>3.89±0.82</td>
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<tr>
<td>Fun</td>
<td>3.81±0.89</td>
<td>.81</td>
<td>3.92±0.77</td>
<td>3.82±0.95</td>
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<tr>
<td>Energy Release</td>
<td>3.60±0.88</td>
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<td>3.74±0.83</td>
<td>3.33±1.00</td>
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<td>Miscellaneous</td>
<td>3.00±0.91</td>
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<td>3.31±0.91</td>
<td>2.89±0.64</td>
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<td>Basic Psych. Needs</td>
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<td></td>
<td></td>
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<tr>
<td>Autonomy Sat.</td>
<td>3.84±0.83</td>
<td>.91</td>
<td>3.80±0.91</td>
<td>4.09±0.56</td>
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<tr>
<td>Autonomy Frus.</td>
<td>2.07±0.88</td>
<td>.83</td>
<td>2.00±0.93</td>
<td>1.90±0.66</td>
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<tr>
<td>Competence Sat.</td>
<td>3.67±0.86</td>
<td>.94</td>
<td>3.70±1.02</td>
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<tr>
<td>Competence Frus.</td>
<td>1.81±0.91</td>
<td>.87</td>
<td>2.51±1.13</td>
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<tr>
<td>Relatedness Sat.</td>
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<td>3.54±0.93</td>
<td>3.66±0.59</td>
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<tr>
<td>Relatedness Frus.</td>
<td>2.33±1.04</td>
<td>.91</td>
<td>1.88±1.06</td>
<td>1.93±0.79</td>
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<tr>
<td>Social Support</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASS</td>
<td>2.29±1.12</td>
<td>.93</td>
<td>2.06±1.14</td>
<td>1.98±0.98</td>
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<tr>
<td>Outcomes</td>
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<td></td>
<td></td>
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<tr>
<td>Mental Health</td>
<td>36.83±10.25</td>
<td>.76</td>
<td>36.58±10.30</td>
<td>39.05±9.98</td>
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<td>Subjective Vitality</td>
<td>26.79±7.87</td>
<td>.76</td>
<td>27.09±7.80</td>
<td>30.00±6.17</td>
</tr>
</tbody>
</table>

Note. H4H = Help for Heroes; H4HSR = Help for Heroes 'Sports Recovery' Pathway; NE = Non-Engagers; ST = Short-term Engagers; LT-I = Long-term Infrequent Engagers; LT-F = Long-term Frequent Engagers; Part. Motivation = Participation Motivation; Sat. = Satisfaction; Frus. = Frustration; PASS = Perceived Available Social Support.
Figure 1. A framework for testing aims pertaining to engagement with Help for Heroes. Note. H4H = Help for Heroes; H4HSR = Help for Heroes Sports Recovery Pathway; NE = Non-engagers; ST = Short-term Engagers; LT-I = Long-term Infrequent Engagers; LT-F = Long-term Frequent Engagers.