Research Article

# The Potential of Conversational AI for Mental Health Support in UK Armed Forces Personnel and Veterans: A Mixed-Methods Health Needs Assessment and Feasibility Study

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**Background: Mental health conditions represent a significant challenge for United Kingdom (UK) armed forces personnel and veterans. Despite comprehensive support services, persistent barriers contribute to a treatment gap. This paper explores the potential of conversational artificial intelligence (AI), or voicebots, as a novel intervention to bridge this gap.**

**Methods: A mixed-methods study was conducted to assess the feasibility and user acceptance of a voicebot intervention. The study comprised an online survey of 146 serving and former UK military personnel to gather quantitative data on technology use and comfort levels, and qualitative data on perceived barriers to care. This was supplemented by key informant consultations (N=4) with senior military and healthcare leaders to understand the institutional perspective.**

**Results: A disconnect was found between institutional perceptions and user-reported experience. While leadership often cited stigma as the primary barrier, users identified systemic and logistical issues, such as 'Time / Availability of Appointments' (60%), as the main obstacle, with stigma cited by only 8% of respondents. The mean comfort score (out of 5) for discussing health issues with a human professional was 4.0, compared to 2.6 for a voicebot. However, 54% of respondents indicated a willingness (scores of 3, 4, or 5) to use a voicebot for confidential health information, with acceptance paradoxically higher among older, more experienced personnel.**

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**Conclusion: A significant unmet mental health need persists within the UK military community, driven more by systemic barriers than cultural stigma. Conversational AI is a potentially acceptable adjunct to existing care pathways, particularly for an older, pragmatic cohort. Addressing logistical bottlenecks in the current system is as critical as developing new technological solutions. Rigorous evaluation of a voicebot MVP, integrated into existing frameworks, is warranted.**

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# Introduction

## *The enduring challenge of military mental health*

The mental health and wellbeing of serving and former members of the United Kingdom (UK) armed forces is a matter of national importance and significant public health concern.[1] Official statistics from the Ministry of Defence (MOD) indicate that in the 2023/24 financial year, 1 in 8 (13.0%) UK Armed Forces personnel were seen by military healthcare services for a mental health-related reason. While this rate has remained stable in the latest year, it reflects a sustained rise over the preceding decade.[2] The most common diagnoses among those requiring specialist care are adjustment disorders and depressive episodes.[2]

However, these administrative data, which capture only those who formally present to services, likely underestimate the true scale of the problem. Longitudinal research from the King's Centre for Military Health Research (KCMHR), which follows a large cohort of personnel over two decades, provides a more comprehensive epidemiological picture. The latest phase of this study found that 28% of current and former personnel reported symptoms of a probable Common Mental Disorder (CMD), such as anxiety or depression, and 9% reported symptoms of probable Post-Traumatic Stress Disorder (PTSD).[3] These figures represent a notable increase from 22% for CMD and 6% for PTSD in 2014/16, suggesting a growing, rather than diminishing, burden of mental ill-health within the military community.[3]

The marked disparity between the high prevalence of symptoms estimated in cohort studies and the lower rates of formal presentation recorded by the MOD is not a contradiction. Instead, it quantifies a critical treatment gap. This gap represents a large, symptomatic population that, for a variety of reasons, is not engaging with the established healthcare system. This fundamental challenge—the gap between

need and access—provides the central justification for exploring novel, low-barrier interventions designed to reach those who are currently unserved.

### *Persistent barriers to help-seeking*

The failure to access care is driven by a complex interplay of cultural, systemic, and personal barriers. Within the armed forces, a culture that necessarily values stoicism, psychological resilience, and self-reliance can inadvertently create a powerful stigma around mental illness[4][5][6]. Service personnel may fear that admitting to a mental health problem will be perceived as a sign of weakness, potentially damaging their career prospects or leading to medical discharge.[4] Studies show that this anticipated stigma is one of the most commonly cited barriers to seeking help.[5] This cultural reluctance can persist long after an individual has left the service.[6]

Beyond stigma, personnel and veterans face significant systemic and practical obstacles. For veterans transitioning to civilian life, navigating the complexities of the National Health Service (NHS) can be daunting.[7] Many report a lack of knowledge about where to find appropriate help and a lack of trust in civilian healthcare providers who may not be culturally competent or understand the unique context of military life and service-related conditions.[7] Indeed, research has shown that as little as 8.7% of veterans are correctly identified as such in NHS records, hindering their referral to specialist services.[8] Practical issues such as long waiting lists, difficulty scheduling appointments, and the need to take time off work for treatment further compound the problem.[5]

### *The digital health opportunity and study aims*

The rapid evolution of digital technologies presents new opportunities to mitigate some of these long-standing barriers. The digital health and wellness market has expanded dramatically, with over 318,000 health apps available and a significant increase in use following the COVID-19 pandemic.[9] Concurrently, the proliferation of smart devices and voice-activated assistants has created a new platform for interaction. In 2020, there were over 4.2 billion devices worldwide capable of hosting digital voice assistants like Siri and Alexa, with this number projected to double by 2024.[10]

This paper reports on a study that posits that conversational AI, delivered via voicebots on these ubiquitous devices, could represent a valuable new tool in military mental healthcare. A voicebot could

offer an anonymous, non-judgemental, and highly accessible first point of contact for individuals hesitant to engage with formal services. This report, therefore, has three primary aims[9][10][11]:

1. To conduct a mixed-methods feasibility study assessing the barriers to care and user acceptance of a voicebot solution among UK armed forces personnel and veterans.
2. To critically evaluate the potential of conversational AI as a scalable, low-stigma adjunct to the existing care ecosystem.
3. To provide evidence-based, actionable recommendations for the potential development and implementation of such a technology.

## A critical review of the current UK military mental health landscape

To understand where a novel intervention might fit, it is essential to first map the existing support ecosystem. The UK has a well-developed, multi-layered system of care for both serving personnel and veterans, delivered through a partnership between the MOD, the NHS, and the third sector.

### *Service provision for serving personnel*

For active-duty personnel, the MOD operates a stepped-care model.[11] The first point of contact is typically the unit Medical Officer in the primary care setting, who functions similarly to a civilian General Practitioner (GP).[11] They manage the majority of mental health presentations. For individuals with more complex needs, the Medical Officer can refer them to specialist services provided by the MOD's Departments of Community Mental Health (DCMHs). These multidisciplinary teams offer outpatient assessment and treatment. For the most severe cases requiring hospitalisation, care is provided by an MOD-contracted in-patient service.

This clinical pathway is supplemented by a range of preventative and educational initiatives. These include Trauma Risk Management (TRiM), a peer-support system designed to promote resilience and identify signs of stress in colleagues after traumatic events, and widespread mental health awareness training for all ranks, aimed at reducing stigma and encouraging early help-seeking.[6]

### *The veteran support ecosystem: A post-service safety net*

Upon leaving the armed forces, responsibility for healthcare transitions to the NHS. In recognition of the specific needs of veterans, NHS England has established a dedicated mental health pathway: Op

COURAGE: The Veterans Mental Health and Wellbeing Service. Launched to consolidate and simplify previous offerings, Op COURAGE provides a single, clearer point of entry for veterans across England.[12]

The service is designed to help serving personnel approaching discharge, reservists, and veterans, regardless of when they left service.[12] It provides comprehensive assessments and treatment for a range of mental health difficulties, including anxiety, depression, substance misuse, and PTSD. Veterans can self-refer or be referred by a GP or a charity. Op COURAGE works in close partnership with a network of military charities that provide crucial wrap-around support. These include: Combat Stress, which offers specialist treatment and a 24/7 helpline; Help for Heroes, which provides recovery services and support for families; and Togetherall, an online platform offering anonymous peer support and guided self-help courses. This integrated model is complemented by services like Op RESTORE, which addresses service-related physical health problems, ensuring a holistic approach to veteran wellbeing.

### *Synthesizing the need and provision: A persistent gap*

This comprehensive ecosystem demonstrates a clear commitment to supporting the mental health of the military community. However, the data reveals a central paradox: despite the availability of high-quality, specialist services, a large proportion of those in need are not accessing them.[13] The disconnect highlights that the primary challenge may not be an absolute deficit of services, but rather a failure to effectively engage a hard-to-reach segment of the population. The problem lies at the "front door" to care. This reframes the strategic imperative from simply building more specialist capacity to creating more accessible gateways that can guide users towards the support that already exists.

## Methods

### *Study design*

A mixed-methods research methodology was employed to triangulate findings and generate in-depth insights. The study combined a quantitative online survey with qualitative key informant consultations. This approach allowed for the statistical analysis of user attitudes while capturing the nuanced perspectives of senior leaders.

### *Participant recruitment and sampling*

**Survey:** A cross-sectional survey was administered to a convenience sample of 146 serving and former UK Armed Forces personnel. Participants self-identified their status as either currently serving or a veteran. Recruitment occurred through two primary channels: direct engagement with an Army regiment (36 Engineer Regiment) and distribution via online veteran networks on Facebook and LinkedIn. While this method achieved the target sample size, it is important to acknowledge its limitations upfront. The resulting sample was predominantly senior in rank, male, and from an Army background, which limits the generalisability of the findings to the broader military community, particularly female veterans, junior ranks, and personnel from the Royal Navy and Royal Air Force. Furthermore, this sampling method may have introduced bias towards more digitally literate individuals and potentially excluding those with lower digital literacy or access to digital services.

**Key informant consultations:** To gather an expert, strategic perspective, semi-structured key informant consultations were conducted with a purposively selected sample of four individuals: two senior military leaders (Commanding Officer and Second-in-Command of an Army regiment) and two senior healthcare professionals (a clinician and a national commissioner). Given the small, expert nature of this sample, the term "key informant consultations" is used to reflect their exploratory purpose. Due to the sensitive nature of the discussion and to encourage candid responses, the consultations were not recorded; detailed notes were taken instead.

### *Data collection*

**Survey:** The online survey instrument was designed to collect data across several domains:

- **Demographics:** Age, gender, service branch, rank, and years of service.
- **Technology use:** Ownership of and frequency of interaction with smart speaker/voice assistant devices.
- **Comfort with disclosure:** A 5-point Likert scale was used to measure comfort levels discussing personal health information with both a human professional and a voice assistant. Specific questions asked about comfort discussing "personal and confidential health information" generally, and a separate question specified comfort discussing "a physical injury, sexual health or mental health".
- **Barriers to care:** An open-ended, free-text question asked respondents: "What do you see as the biggest barriers to accessing mental health care?".

**Key informant consultations:** A semi-structured interview guide was used for the consultations. Questions for military leaders focused on the perceived prevalence and operational impact of mental health issues and views on existing support services. Questions for healthcare professionals focused on common access challenges from a service-delivery perspective and the potential role of digital interventions.

### *Data analysis*

**Quantitative analysis:** Descriptive statistics (means, frequencies, percentages) were calculated for demographic, technology use, and Likert scale data from the survey.

**Qualitative analysis:** A thematic analysis was conducted on the 145 free-text responses to the survey question regarding barriers to care. A primary researcher used an inductive approach, allowing themes to emerge directly from the data. A codebook was developed and refined during this process. To ensure reliability, a second researcher independently coded a 20% sample of the responses. Discrepancies were resolved through discussion to reach a consensus on the final thematic framework and coding structure. The free-text responses were generally detailed, typically 2-3 sentences in length, and often provided specific examples of the barriers encountered, which provided a rich dataset suitable for thematic analysis. This process allowed for the quantification of theme frequency, as presented in the Results section.

## Results

### *Sample characteristics*

The survey yielded 146 complete responses. The demographic characteristics of the sample, detailed in Table 1, confirm that respondents were predominantly male (96%), serving in the Army (91%), and of senior rank. Of the respondents, 75.3% (n=110) held the rank of Captain or above. The mean age was 41.2 years, with a mean of 16.5 years of service.

| Characteristic | Category | N | % |
|---|---|---|---|
| **Gender** | Male | 140 | 95.9% |
| | Female | 6 | 4.1% |
| **Service Branch** | Army | 133 | 91.1% |
| | Royal Navy / Marines | 7 | 4.8% |
| | Royal Air Force | 6 | 4.1% |
| **Rank** | Officer (Captain and above) | 110 | 75.3% |
| | Other Ranks & Junior Officer | 36 | 24.7% |
| **Status** | Serving | 72 | 49.3% |
| | Veteran | 74 | 50.1% |

**Table 1.** Demographics of survey respondents (N=146)

### *Barriers to accessing mental health care*

Thematic analysis of free-text responses revealed that systemic and logistical issues were cited far more frequently than cultural or stigma-related barriers. As shown in Table 2, 60% of respondents identified 'Time / Availability of Appointments' as a significant barrier. This theme encompassed both the long waiting times between referral and treatment, and the difficulty of finding appointment slots compatible with work and personal schedules. In stark contrast, 'Stigma / Fear of Career Impact' was mentioned by only 8% of respondents.

One respondent, a serving Officer, encapsulated the access issue: "It's not that I'm afraid to ask for help, it's that when I do, I'm told the wait is three months. My operational tempo doesn't allow for that kind of delay."

| Barrier Theme | N | % |
|---|---|---|
| **Time / Availability of Appointments** | 87 | 60.0% |
| **Lack of Knowledge of Services** | 45 | 31.0% |
| **Lack of Trust in Civilian Providers** | 28 | 19.3% |
| **Long Waiting Lists** | 22 | 15.2% |
| **Stigma / Fear of Career Impact** | 12 | 8.3% |

**Table 2.** User-Reported Barriers to Accessing Mental Health Care (N=145 responses)

### *User Acceptance of voicebots*

When asked to rate their comfort discussing personal health issues on a scale of 1 (very uncomfortable) to 5 (very comfortable), respondents reported a mean score of **4.0** (SD 1.15) for interacting with a human professional. The mean comfort score for discussing "physical injury, sexual health or mental health" with a voice assistant was **2.6** (SD 1.2).

Despite the lower mean score, there was significant openness to the technology. When asked about discussing "personal and confidential health information" with a voicebot, **54%** of respondents gave a neutral or positive rating (a score of 3, 4, or 5). Further analysis indicated that comfort with using a voicebot appeared to increase with age and years of service.

### *Key informant perspectives*

The consultations with senior leaders revealed a strong belief that stigma remains the principal barrier to help-seeking. They emphasised the cultural importance of resilience and the fear of career repercussions as key deterrents. This perspective contrasts sharply with the user-reported data, which prioritised logistical challenges.

As one senior commander noted: "We have a culture of being robust. The biggest hurdle is getting our people to put their hand up in the first place and admit they have a problem."

# Discussion

## *Synthesis and implications*

This study provides important insights into the feasibility of using conversational AI in military mental healthcare. The findings suggest that while a voicebot is not a panacea, it represents a potentially acceptable complementary tool for a specific segment of the military community. The central finding, however, is the critical disconnect between the perceived barriers to care held by leadership and the actual barriers reported by service users.

## *The disconnect between perceived and actual barriers*

The most powerful finding of this study is the disparity between the command focus on stigma and the user focus on logistics. While decades of effort have rightly gone into anti-stigma campaigns like TRiM, our data suggests these may have been more successful than assumed.[6] For this cohort, the problem is not a reluctance to ask for help, but the difficulty in receiving it. The fact that systemic issues like appointment availability (60%) were cited nearly eight times more frequently than stigma (8%) provides strong evidence that cultural programmes alone, while important, will not solve the access problem without addressing the underlying logistical bottleneck. This suggests a need to rebalance strategic efforts and resources towards improving the efficiency and accessibility of the care pathway itself.

This perception of long waits aligns with systemic realities. While the NHS has a target for 92% of patients to start treatment within 18 weeks of referral, this has not been met since 2016, and people can wait significantly longer for mental health treatment than for physical health care . This suggests user-reported barriers are a reflection of genuine system constraints rather than mere perception. The problem is further compounded by a significant funding disparity; veteran-specific mental health services receive only around £10 million annually, approximately 0.07% of the total NHS mental health budget, despite veterans comprising a much larger proportion of the population.

The discrepancy between user-reported data and key informant perspectives on stigma is notable. This may be partly explained by the self-selecting nature of the survey sample, who may already be more engaged with mental health topics. However, it may also reflect the complex nature of stigma itself, which can be unconscious or internalised. Ingrained societal and military norms around masculinity and stoicism may lead individuals to frame their reluctance to seek help in practical terms (e.g., "I don't have time") rather than acknowledging underlying emotional barriers or a lack of emotional literacy.

### *User acceptance and the pragmatism of experience*

The finding that 54% of users are open to interacting with a voicebot about their health is promising. The lower mean comfort score for AI (2.6) versus a human (4.0) is expected and appropriate; the technology should augment, not replace, human clinicians. The counterintuitive finding that acceptance is higher among older, more experienced personnel is a key contribution. One hypothesis is that this is driven by pragmatism; personnel who have spent years navigating the military healthcare system may have first-hand experience of its logistical frustrations and are therefore more open to a pragmatic, immediate, and accessible alternative, even if it is less ideal than a human interaction. An alternative, or complementary, hypothesis is that this cohort may have higher levels of internalised stigma and therefore value the anonymity and non-judgemental nature of an AI tool. This suggests that an initial rollout of a voicebot MVP could be successfully targeted at veterans and mid-career personnel.

### *Limitations*

The study's limitations must be clearly acknowledged. The convenience sampling method resulted in a cohort that is not representative of the entire UK armed forces community. The sample is predominantly senior, male, and from the Army. The online recruitment method likely biased the sample towards individuals with a baseline of higher digital literacy, access and acceptability. Therefore, the findings cannot be generalised with confidence to female personnel, junior ranks, or other service branches, who may face different barriers and have different attitudes towards technology.[14] The small sample size (N=4) for the key informant consultations means these findings are exploratory and indicative of a command perspective, not definitive. The authors recognize that key barriers to accessing mental health services may differ between different demographic groups, and further research is required in this area to establish if certain groups are disproportionately affected by access barriers, for example there may be material differences between those who remain in active service compared to those who are veterans.

Additionally, the survey was conducted in early 2022. Since this time, there has been a significant widespread adoption of AI technologies across multiple sectors, meaning that perceptions of the technology's appropriateness and capabilities may have shifted significantly.

Finally, this study did not include a civilian comparison group, which could have provided valuable context on whether the observed attitudes towards AI in healthcare are specific to the veteran community. Future research must employ stratified sampling to capture a more representative cross-section of the military population.

## Conclusion and recommendations

A significant mental health treatment gap persists within the UK military community. This study suggests it is driven less by the cultural barrier of stigma, as is often assumed, and more by the systemic barrier of timely access to care. Conversational AI presents a potentially viable and acceptable adjunct to the current support ecosystem, acting as a confidential and scalable gateway to care.

Based on this analysis, the following recommendations are made:

1. **Address systemic barriers:** The MOD and NHS should prioritise efforts to improve the logistical efficiency of existing mental health pathways, addressing wait times and appointment availability, as these are the primary barriers reported by users.
2. **Pilot a voicebot MVP:** Co-fund the development and pilot of a Minimum Viable Product (MVP) voicebot. Its function should be focused on psychoeducation and intelligent signposting to existing, high-quality services like Op COURAGE, rather than standalone therapy.
3. **Targeted implementation:** The initial rollout of such a pilot should be targeted at the cohort identified as most receptive: mid-to-late career personnel and veterans, who may value the pragmatism and immediacy of a digital solution. Integrating the tool within the existing TRiM framework could increase adoption and success.
4. **Further research:** Future research must use more robust sampling methods to understand the needs and preferences of under-represented military populations, including women, junior personnel, and those from the Navy and RAF (Royal Air Force), to ensure digital interventions are equitable and effective for all. Additionally, further research must gather granular details of demographics to assess differences between groups and identify inequities in access to services.

## Statements and Declarations

### *Conflicts of interest*

The authors declare that they have no competing interests.


### *Funding*

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## *Ethics approval and consent to participate*

This project was conducted as part of an MBA project within Alliance Manchester Business School in 2022. This study did not gather data on medical information or history, and aimed to ask no questions which risked physical, mental or sociological detriment for individuals that interacted with, and ensured all survey participants are anonymised with no identifiable data gathered. This was discussed with allocated University of Manchester supervisor. Following discussion, it was agreed this project would not require research ethics committee approval. This research project also utilised United Kingdom Research Institute Medical Research Council online assessment tool to ensure research ethics committee approval was not required.

## *Availability of data and materials*

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## *Authors' contributions*

- Designing project – All
- Drafting report – All
- Designing survey – All
- Distributing survey - CH
- Literature review – BE, JG, SH
- Data analysis – BE, JG, SH, CH, EW, ES
- Expert interviews – JH, CH
- Editing manuscript – All
- Expert mental health review – EW, ES
- Final drafting and submission – JH, ES
- Review of peer-review, redraft, and resubmission – EW, ES

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