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Supporting mental well-being of healthcare workers using a mobile app: a mixed-methods feasibility study protocol

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Abstract

Poor mental wellbeing is a common challenge for healthcare workers. Mobile application-based interventions have shown growing attention to improve mental wellbeing due to their accessibility, cost efficiency, and ease of use. This study aims to assess the feasibility of a self-monitoring based mobile app to promote mental wellbeing of healthcare workers/trainees in the UK. Two-arm feasibility randomised controlled trial (RCT) will be conducted. While the control group will be informed about mental wellbeing improvement steps on a NHS website, the intervention group will use the mobile application (MYARKEO) for 6 weeks. Pre and post data will be collected through the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), the Depression Anxiety and Stress Scale (DASS-21), and the mHealth App Usability Questionnaire (MAUQ). Semi-structured interviews will be conducted with the intervention group. Primary outcomes will include (1) recruitment rate, (2) adherence to the intervention and control groups, (3) data collection procedures, (4) attrition rates and underlying reasons, and (5) the usability of the mobile app. The interviews will provide better understanding of user interactions with the mobile app.

Troubleshooting

Study aim

1 The primary aim of this study was to assess the feasibility of a self-monitoring-based mobile app called MYARKEO, to improve mental well-being among healthcare workers and trainees in the UK. The secondary aim was to qualitatively explore the mobile app's acceptability and usability through users' daily experiences, identifying barriers and facilitators to engagement with the monitoring.

Method

2 Two-arm prospective feasibility randomised controlled trial (RCT) with a nested qualitative study. The intervention group will use MYARKEO to monitor mental well-being over 6 weeks, and a non-intervention control group. Data will be collected at baseline and post-intervention and will include the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), the Depression Anxiety and Stress Scale (DASS-21), and the mHealth App Usability Questionnaire (MAUQ). Qualitative data will be collected through semi-structured interviews. Reporting will be guided by the Consolidated Standards of Reporting Trials (CONSORT) for pilot and feasibility studies, the Checklist for Reporting Qualitative Studies (COREQ-32), and mobile health (mHealth) evidence reporting and assessment (mERA) checklist.

Intervention

3 The MYARKEO app, designed in English, enables users to track various aspects of their mental health. By generating a daily score based on user-reported data, the app provides insights tailored to individual needs, fostering self-awareness and behavioural change. The app incorporates principles of self-determination theory (SDT) and Reinforcement Theory (RF). SDT posits that individuals are motivated to engage in behaviours that satisfy their needs for autonomy, competence, and relatedness. The app supports autonomy by allowing users to customise their tracking, competence by providing daily scores, and relatedness through potential discussion of their progress with friends or family members. The RF suggests that behaviour is shaped by reinforcement, and the app uses daily scores to positively reinforce healthy habits.

Participants and setting

4 Healthcare workers or healthcare trainees, ≥18 years of age, with access and ability to use a mobile app, from any healthcare related occupational group, working in the UK, were eligible to participate. Participants were excluded if they were away from work or studies due to mental ill-health.

Recruitment

5 Participants will be recruited through social media posts and e-mails among professional networks, including Twitter (now 'X'), Facebook, two digital newsletters produced by the UK Foundation of Nursing Studies, and the UK Florence Nightingale Foundation. Convenience and snowball sampling will be applied. Interested participants will be sent the study participant information sheet (PIS) and online informed consent will be obtained.

Randomisation

6 Randomisation to the groups will be undertaken by a researcher who is independent of the study team, using a computer-generated random sequence.

Sample size

7 There is no agreed sample size for a feasibility study, although based on previous literature we aim to recruit at least 40 participants.

Intervention arm

8 A commercially developed mobile app called MYARKEO (accessed on the Apple Store and Play Store), which primarily supports participants to engage in daily monitoring of mental well-being over six weeks. The goal of the intervention is to promote participants' mental well-being by stimulating their self-awareness and self-care in their lifestyle. MYARKEO functions as a standalone self-tracking tool stimulating participants to keep a daily record of their health-related behaviour, symptoms and mood. Participants are asked to track a range of physical lifestyle factors and mental well-being items, including daily mood, stress levels, anxiety, work-related stress, low energy, general worry, negative thoughts, dietary choices, sleep patterns, exercise routines, caffeine and alcohol consumption, smoking habits, medication usage, menstrual cycles, and menopause symptoms.

Control arm

9 E-mail signposting to a National Health Service (NHS) website containing information about mental well-being improvement. This website contains generic information that is widely accessible to the public and provides steps around how to improve mental well-being. No further intervention will be offered to the control arm participants.

Outcomes

10 Primary outcomes focus on the feasibility of a future RCT, and the usability of the intervention as follows: (1) recruitment rate, (2) adherence to the intervention and control groups, (3) data collection procedures, (4) attrition rates and underlying reasons, and (5) the usability of the mobile app. The usability of the mobile app will be evaluated using the mHealth App Usability Questionnaire (MAUQ), specifically designed for mobile health-related apps. Intervention adherence will be measured by daily mobile app usage data. Secondary outcomes include the following: mental well-being, measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS); depression, anxiety, and stress, measured using the Depression, Anxiety, and Stress Scale (DASS-21); and app usability, assessed using the mHealth App Usability Questionnaire (MAUQ).

Interviews

11 All intervention participants will be invited to undertake a qualitative semi-structured interview exploring users' interactions with the mobile app and evaluating its perceived usability.

Data Analysis

12 (a) Quantitative data analysis
The quantitative analysis will be predominantly descriptive, with a primary focus on determining feasibility by estimating recruitment, attrition, and non-compliance rates. At the end of the six-week study period, raw usage data from the mobile app will be descriptively analysed (though frequency counts) to explore the frequency with which items (symptoms, behaviours) were monitored. The daily engagement rate will be calculated by dividing the total days participants actively used the app by the total possible usage days. Means and standard deviations of mental health and well-being outcomes by the group at baseline and post-intervention will be calculated to indicate the likelihood of change in outcome measures (to inform a future trial). IBM SPSS Statistics (Version 26) will be used for data analysis.
(b) Qualitative data analysis
Braun and Clarke’s thematic analysis approach will be applied to the interview data. Transcriptions will be uploaded to NVivo v12 for the initial coding and subsequent inductive grouping into potential themes.
Data triangulation will be done by integrating qualitative data from semi-structured user interviews with quantitative data collected from the mobile app use findings and survey responses. Data about reasons for dropouts, consistency of the use, acceptability and usability of the app will be triangulated.

Results

13 We will describe uptake, drop-out rates, average daily app usage. Participant monitoring behaviours will be described. Interview data will be analysed using thematic analysis.

Dissemination

14 Anonymised findings will be published in a scientific journal article and presented at academic conferences.

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