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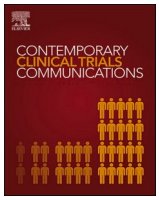

Long COVID coping and recovery (LCCR): Developing a novel recovery-oriented treatment for veterans with long COVID

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ABSTRACT

Background: Long COVID has affected 13.5% of Veterans Affairs (VA) Healthcare System users during the first pandemic year. With 700,000+ United States Veterans diagnosed with COVID-19, addressing the impact of Long COVID on this population is crucial. Since empirically-based mental health interventions for Long COVID are lacking, a vital need exists for a tailored recovery-oriented intervention for this population. This study intends to assess the feasibility and acceptability of a novel recovery-oriented intervention, Long COVID Coping and Recovery (LCCR), for Veterans with Long COVID, aiming to support symptom management and quality of life. LCCR is an adaptation of Continuous Identity Cognitive Therapy (CI-CT), a suicide recovery-oriented treatment for Veterans.

Methods: In a two-year open-label pilot, three single-arm treatment trials will be conducted with 18 Veterans suffering from Long COVID. Each trial includes 16 weekly 60-min sessions delivered via VA Video Connect (VVC) and/or VA WebEx. Primary objectives include optimizing LCCR for Veterans with Long COVID and assessing the acceptability and feasibility of the intervention, using attendance and retention rates, drop-out statistics, and client satisfaction levels. Additionally, potential benefits of LCCR will be explored by evaluating alterations in quality of life, resilience, mental health status (anxiety, depression, suicide risk/behavior), and personal identity. The protocol has been tailored based on Veterans' needs assessment interviews and stakeholder feedback.

Conclusion: If the LCCR intervention proves feasible and acceptable, a manualized version will be created and a randomized controlled trial planned to examine its efficacy in the broader Veteran population.

1. Introduction

Recent epidemiological estimates indicate that 10% of over 651 million documented COVID-19 cases globally have experienced Post-Acute Sequelae of COVID-19 (PASC) [1]. PASC, colloquially known as Long COVID, is a condition characterized by "signs and symptoms following initial SARS-CoV-2 infection, that persist for more than one month (in mild cases), and more than three months (in cases severe enough to warrant oxygen support), which have a disproportionately severe effect on a patient's quality of life, far beyond what is expected from their initial infection" [2]. Recent data suggest that one in five adults in the United States (U.S.) experience Long COVID symptoms post-infection ([39]). Although estimates and impacts of Long COVID vary, 13.5% of Veteran Health Administration (VHA) users were effected by Long COVID during the first pandemic year [43]. Current outcomes have implications for the over 700,000 Veterans diagnosed with COVID-19 across the U.S. [3].

A study of 236,379 Long COVID patients found that approximately 34% developed psychiatric or neurological diagnoses six months post-infection, in addition to negative physiological outcomes [4]. Similarly, a study of VHA users ($N = 73,435$) found an increase in mental health challenges including sleep disorders, anxiety disorders, and trauma, six months after COVID-19 diagnosis [5]. Further, a report on one-year longitudinal follow-up data on hospitalized COVID-19 patients [6] noted statistically significant increases in anxiety or depression from the six-month to 12-month time points. These findings are crucial in

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estimating the impact of Long COVID on Veterans, who have unique vulnerabilities due to increased incidence of trauma, physical, and psychiatric risk factors [7–9].

Although Long COVID symptoms can result in significant mental health and functional impairment [10,11,[41], there are few empirically supported treatment approaches incorporating both dimensions. Additionally, many in the field contend that given the complexity and variability of Long COVID manifestations, successful treatment cannot be considered from a single-organ point of view, instead requiring a multidisciplinary approach [12,13]. Consequently, although addressing symptom relief is crucial [1], there is a gap in Long COVID interventions that center on recovery-oriented treatments for the mental health impacts, even as symptoms persist.

In recent years, mental health recovery has shifted its focus from merely achieving symptom remission to a recovery orientation, which involves attaining a fulfilling life despite the presence of mental health symptoms [14]. Multiple frameworks have been developed to identify the core factors of personal recovery, including the widespread CHIME model [15], which identifies five essential recovery processes: ***C***onnectedness, ***H***ope and optimism about the future, ***I***dentity, ***M***eaning in life, and ***E***mpowerment [15]. Studies indicate that recovery-oriented mental health care improves the lives of those with persistent symptoms [16].

The CHIME model's recovery-oriented approach is particularly relevant to Long COVID treatment, as it emphasizes personal growth, resilience, and well-being, even amidst ongoing symptoms. Long COVID Coping and Recovery (LCCR) is a novel, manualized mental health intervention for Veterans with Long COVID, focusing on improving functional status, identity growth, psychological adjustment, coping, resilience, and life satisfaction. This approach targets the five CHIME recovery processes, utilizing psychotherapeutic techniques such as skills training, acceptance, mindfulness, narrative identity, and future self-continuity principles. By applying the CHIME framework to the LCCR intervention, Veterans with Long COVID may be able to concentrate on developing a personally meaningful approach to addressing, and if need be, living with, the symptoms of Long COVID to improve function and move towards recovery. This approach addresses the complex nature of Long COVID and its impact on mental health.

LCCR was developed by adapting existing recovery-based group interventions piloted at the VA, including Continuous Identity Cognitive Therapy (CI-CT). CI-CT, specifically designed for Veterans experiencing post-acute suicidal episodes (PASE), aims to nurture a positive sense of identity, life narrative, and personal agency. With demonstrated acceptability, feasibility, and preliminary efficacy, CI-CT is a valuable treatment option [17].

CI-CT emerged as a response to limitations of prevalent suicide prevention treatments. In contrast to conventional treatments that target acute aspects of suicidal cognitions and risk factors [18], CI-CT emphasizes reconstructing a positive identity, enhancing clients' perception of their present-to-future self-narrative (known as Future Self Continuity (FSC))[42], and fostering hope and optimism for their future selves [17]. CI-CT's distinctive psychotherapeutic intervention, which prioritizes identity growth, purpose, meaning, and recovery even amidst ongoing suicidal ideation, was well suited to be adapted for a recovery-oriented treatment designed to address Long COVID recovery.

To effectively adapt CI-CT for the Long COVID population's recovery needs, members of the study team reviewed the CI-CT treatment manual and identified key therapy components along with recovery-oriented concepts that relate to Long COVID needs, such as finding meaning and purpose, viewing the present as one part of a life story, and understanding how the present affects the kind of future that can be created. These extracted concepts were then developed to pivot away from the original suicide focus toward Long COVID. Additionally, sections of the treatment materials more focused on suicide-specific recovery werereplaced with sections focusing on recovery in the context of Long COVID's physical and psychological symptoms. Finally, we organized the session content into two modules: Module 1 focuses on addressing immediate coping issues as a result of Long COVID, including 'pacing,' and Module 2 focuses on longer-term recovery, with greater emphasis on identity and creating a sense of meaning and purpose in life.

LCCR's initial intervention framework was designed to be flexible and personalized to meet the complex needs of Long COVID patients. The initial proposal included a core curriculum of 12 90-min group sessions supplemented by optional sessions to address specific Long COVID issues. Weekly topics were to include presentations from specialist providers, such as pulmonologists and nutritionists, to address the physiological needs of Long COVID patients.

Between November 2021 and July 2022, our team conducted semi-structured interviews with 22 Long COVID Veteran participants from the James J. Peters Department of Veteran Affairs Medical Center (JJP VAMC) Long COVID Clinic to understand their experiences and needs. Many Veterans reported feeling isolated, misunderstood, and struggled with their identity from having Long COVID. They also reported physical impairments including brain fog and fatigue. In discussing these findings, our team and stakeholder advisory board raised concerns that the initially proposed treatment length (12 sessions) and duration (90 min per session) might mentally and physically overwhelm the participants, hindering skill acquisition, sharing experiences, grasping abstract concepts, and achieving personal growth.

To address these concerns, the session duration was shortened to 60 min, and the number of sessions was increased to 16, organized into two modules (module 1: coping and module 2: recovery/identity-based). This allowed additional time for developing connections and processing treatment content. The revised treatment manual was reviewed by a panel of clinical experts familiar with Long COVID Veteran care. Through three meetings over three months, their feedback on feasibility and the modules' content was incorporated into iterative revisions of the manual's structure and session sequence.

Module 1, comprising the first eight sessions, concentrates on building community support, fostering hope, and improving coping with Long COVID symptoms and resulting functional limitations to enable the Veteran to move forward in their recovery journey. Module 2, the next eight sessions, emphasizes achieving long-term recovery through positive self-development, a valued life story, and a meaningful future. Veterans progress from skill-building in Module 1 to an identity-focused approach in Module 2, aiming for agency, personal growth, and a meaningful life narrative despite dealing with a chronic condition like Long COVID. Table 1 summarizes the brief descriptions of each session within the modules.

Utilizing this revised treatment structure, three open-label trials (n = 4–6 Long COVID Veterans/trial) will be conducted to use an iterative approach for psychotherapy development and optimization. Veteran feedback and acceptability and feasibility data will be gathered before, midway (between Module 1 and 2), and after treatment. Data will be analyzed and the treatment will be further refined with input from a stakeholder advisory board and Veteran feedback. The results will inform the development and implementation of a large-scale randomized controlled trial (RCT) of LCCR, and a final version of the facilitator manual and Veteran workbook will be produced based on the findings.

2. Materials and methods

2.1. Study design

This study will involve three separate cycles of one-arm treatment development trials, with iterative adjustments made to the treatment manual between each cycle based on Veteran and stakeholder feedback. The 16-session treatment will be delivered through VA-approved telehealth platforms VA Video Connect (VVC) and VA WebEx to accommodate the difficulty individuals with Long COVID may have with in-person treatment attendance. VVC is the VA's HIPAA-compliant video-

Table 1
LCCR module and session descriptions with brief objectives.

Module 1: *Laying the Foundation for Recovery*	
Session 1	*Introduction* ● Introducing the therapy and the concept of recovery ● Discussing current Long COVID symptoms and experiences ● Reviewing emergency coping skills
Session 2	*Energy Conservation* ● An introduction to Pacing - "reserving the oil in your tank" ● Addressing barriers to Pacing and Long COVID coping skills
Session 3	*Finding Joy and Self-Care* ● Reviewing self-care strategies ● Finding ways to spark joy
Session 4	*Mindfulness* ● Using mindfulness to foster resiliency with Long COVID ● How to do mindfulness practices
Session 5	*Values* ● Reviewing values and why they matter
Session 6	*Long COVID Health/Personal Growth Skills* ● Moving towards goals related to health/personal growth ● Becoming your own healthcare advocate
Session 7	*Relationship Skills* ● Navigating relationships with Long COVID ● Reviewing relationship dynamics and tips for effective communication
Session 8	*Balancing Life with Long COVID and Module 1 Wrap-up* ● Employment and Education with Long COVID ● Balancing life with Long COVID symptoms
Module 2: *Long Term Recovery - Finding Meaning and Purpose*	
Session 1	*Learning about Recovery as Part of Your Life Story* ● What is long-term recovery and how does it fits into your life story
Session 2	*Your Present as Part of Your Story* ● Viewing your present as only one part of a bigger picture
Session 3	*Thinking about Your Future* ● Continuous self—what has changed over time and what has stayed the same? ● Thinking about the past, present, and future as a means to thinking about what you want your future to look like
Session 4	*Becoming Your Future You* ● How changes and choices you make in the present affect the future
Session 5	*Making Mindful Choices* ● Making mindful choices to get the future you want
Session 6	*Bringing Connectedness into your Story* ● How to be more connected to the people in your life story ● Appreciating the stories of other people
Session 7	*Goals and Barriers for the Future You Want* ● Identifying what you want to change in your life ● Identifying barriers and how to overcome them
Session 8	*Moving Forward* ● Review of what we learned ● What do you want to take with you going forward?

Note: Each bullet point represents the overall objectives and topics discussed in each session within the modules.

conferencing application that allows Veterans to securely interface with providers remotely. VA WebEx is another VA-approved telehealth software that also allows secure telehealth visits. Although VVC is considered the best practice for VA telehealth care, VA WebEx will be used as an approved backup option in the event of technical difficulties.

Three assessment time points (TP) including pre- (TP-1), mid- (TP-2), and post-treatment (TP-3) will be used to collect preliminary evidence of LCCR's ability to improve psychological adjustment to Long COVID symptoms, promote resilience, facilitate coping, and improve functioning in Veterans with Long COVID.

2.2. Participants and recruitment

To participate in the LCCR telehealth treatment, Veterans will be referred through clinicians at the JJP VAMC Long COVID Clinic. This clinic caters to Veterans who have been diagnosed with an initial COVID-19 infection through diagnostic assessments (such as polymerase chain reaction (PCR) or antibody tests) or physician evaluations and are currently experiencing prolonged symptoms. Prior to being enrolled in the study, individuals' medical records will be reviewed to determine preliminary eligibility and suitability for this group treatment. To be pre-screened for participation, individuals will be required to provide information about their COVID-19 diagnosis (e.g., method of diagnosis and the duration of persisting symptoms), as well as basic information (e.g., access to a device with internet and webcam). Following the pre-screen, participants will be assessed for the full inclusion criteria (see section 2.3).

All participants will be required to provide informed consent before enrolling, which will be recorded in their VA medical records. At TP-1, baseline assessments will be conducted to collect clinical characteristics of patients, using the Mini-Mental State Examination (MMSE) [19] to assess cognitive function, and the Modified COVID-19 Yorkshire Rehabilitation Scale (C19-YRSm) [20] to assess Long COVID symptom severity and subsequent functional status. The World Health Organization Disability Assessment Schedule 2nd Version (WHODAS 2.0) [21] will be used to evaluate functional status related to health. Eligible participants (see section 2.3 for eligibility criteria) will be asked to complete a variety of baseline measures. All consent and baseline measures will be collected in person or via telephone.

The initial recruitment aimed for a total of approximately 36 participants (10–12 veterans per group/development trial). However, Veteran feedback indicated interest and potential benefits of group discussion, which a large group size may inhibit if it were to fit within the time limit for each session. The study now intends to have a total sample size of approximately 18 participants, with 4–6 veterans per group to address this.

2.3. Inclusion and exclusion criteria

The inclusion criteria include a positive screen for Long COVID (i.e., a positive COVID-19 diagnosis via PCR and/or an antibodies blood test, and symptoms lasting at least one month after the initial infection). All individuals will meet a mild Long COVID designation (where signs and symptoms persist for more than one month following initial SARS-CoV-2 infection), and some individuals may also meet the severe designation (where symptoms last for more than three months (in cases severe enough to warrant oxygen support)) [2]. A specific mental health diagnosis is not required for participation. For complete inclusion and exclusion criteria, please refer to Table 2.

2.4. Outcome measures

While the primary objectives of this study are treatment development, feasibility, and accessibility, preliminary data will also be collected to identify potential benefits of LCCR. The assessed constructs were divided into primary and secondary outcome measures. Given the focus of LCCR to promote personal recovery while coping with a chronic health condition, the primary outcome is self-assessed functional status. Secondary outcomes include constructs related to quality of life and well-being, resilience, coping, mental health status (such as anxiety, depression, and suicide risk/behavior), and identity concepts.

Table 2
Inclusion and exclusion criteria for the development LCCR trials.

Inclusion criteria	
1	U.S. Veteran
2	Ages 18-80
3	Positive screen for Long COVID (e.g. COVID-19 positive, diagnosed with a PCR test, an antibodies blood test, and or a diagnosis by a physician at the JJP VAMC Long COVID Clinic and symptoms lasting 1 month or longer after infection)
4	Participation in medical/mental health services at the JJP VAMC
5	Sufficient clinical stability and readiness to participate in group therapy as deemed by their VA service provider
Exclusion criteria	
1	Active alcohol or opiate dependence requiring medically supervised withdrawal
2	Active psychosis
3	MINI Mental Status <23 or inability to function in a group setting
4	Unable to operate telehealth platforms or other electronic devices
5	Non-English speaking
6	Lack of capacity to consent
7	Unable or unwilling to provide at least one contact for emergency purposes

Participants will be assessed at three time points (TP) to monitor progress: (TP-1) pre-treatment, (TP-2) mid-treatment after Module 1, and (TP-3) post-treatment after Module 2.

2.4.1. Primary Outcome Measures[1]

World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) [21]**.** The WHODAS 2.0 will be used to assess functional status. The WHODAS 2.0 is a 36-item self-report questionnaire that assesses six domains of functioning across physical and mental health disorders in clinical and non-clinical populations: cognition, mobility, self-care, getting along, life activities, and participation. Items are scored on a Likert scale ranging from 1 (None) to 5 (Extreme or cannot do) and are summed to create total and domain scores.

Modified COVID-19 Yorkshire Rehabilitation Scale (C19-YRSm) [20]**.** The C19-YRSm is a 17-item self-report scale adapted from the original 22-item COVID-19 Yorkshire Rehabilitation Scale [22] that will be used to assess Long COVID symptom severity and subsequent functional status. Items are rated on a scale from 0 (none of this symptom) to 3 (extremely severe level or impact). The C19-YRSm is divided into four subscales: symptom severity, functional disability, other symptoms, and overall health. Subscales are scored by summing the highest scores for each item, with higher scores indicating greater severity.

2.4.2. Secondary outcome measures

Measure of Current Status(MOCS) [23]**.** The MOCS is a two-part measure assessing the impact of intervention-related factors on various aspects of an individual's current status or well-being.Part A, which assesses participants' perceived level of skill for responding to challenges of everyday life (e.g., ability to relax), will be used to measure resilience. It consists of 13 items, with each item rated on a Likert scale from 0 (I cannot do this at all) scale to 4 (I can do this extremely well). Item scores are averaged for the final score.

The Quality of Life Scale (QOLS) [24]**.** The QOLS measures quality of life relevant to diverse patient groups with chronic illness across 6 domains: material and physical well-being, relationships with other people, social, community, and civic activities, personal development and recreation, and independence. There are 16 items with a response scale ranging from 1 (terrible) to 7 (delighted) to indicate levels of satisfaction among the domains. Items are summed for a total score, with higher scores indicating greater quality of life.

Future Self Continuity Questionnaire (FSCQ) [25]**.** The FSCQ will be used to assess individuals' temporal sense of personal identity from the present to the future in three areas: vividness, similarity, and positivity. There are 10 items with a 6-point response metric. The total FSCQ score is averaged from all items and subscale scores from the mean of associated items. Higher scores indicate increased FSC. The total FSCQ and the FSCQ components have demonstrated high levels of reliability and validity and have been used in clinical and nonclinical populations [25,26].

Suicidal Behaviors Questionnaire-Revised (SBQ-R) [27]**.** The SBQ-R is a 4-item measure that will be used to measure suicide risk. Each item taps into a different dimension of suicidality: (1) lifetime suicidal ideation and/or attempt (2) frequency of suicidal ideation over the past 12 months (3) threat of suicide attempt and (4) self-reported likelihood of future suicidal behavior. Items are summed for a total score (range from 3 to 18), with higher scores indicating increased severity and risk.

Patient Health Questionnaire-9 (PHQ-9) [28]**.** The PHQ-9 is a 9-item depression module from the full PHQ with each item representing a depressive symptom. Items are scored on a scale ranging from 0 (not at all) to 3 (nearly every day) to assess the frequency of each symptom over a two-week period. Items are summed for a total score (range from 0 to 27), with higher scores indicating increased depression severity.

Generalized Anxiety Disorder-7 (GAD-7) [29]**.** The GAD-7 is a brief self-report measure to assess Generalized Anxiety Disorder symptoms and severity over the course of the last two weeks. The scale has 7 items on a Likert scale from 0 (never) scale to 3 (almost every day). Items are summed for a total score (ranging from 0 to 21). The GAD-7 has excellent reliability and validity [29].

2.5. Protocol and procedure

Participants will begin treatment within approximately one month of completing informed consent and baseline procedures. All self-report follow-up data will be collected on Qualtrics immediately following treatment completion (< week between finishing Module 1 and starting Module 2, and <1 month after finishing Module 2). Compensation of up to $300 will be provided for assessment completion (TP-1 = $75, TP-2 = $75, TP-3 = $75). Participants will receive an additional $75 for participating in qualitative interviews conducted after Module 2 (TP-3) and a $50 bonus for completing 75% of the sessions (Module 1 = $50, Module 2 = $50), for a total of up to $400.

2.5.1. LCCR intervention

LCCR individual groups will meet through either the VVC or VA WebEx telehealth platform for 60-min weekly meetings over a 16-week course with 4–6 participants per group (approximately 18 participants in total; refer to section 2.2 for additional information). Before the first session, participants will receive the LCCR workbook containing all LCCR therapy content and optional individual work to be completed between sessions (please refer to Table 1 for additional information about treatment content and structure). The study coordinator will review the Group Telehealth Agreement with each participant, prior to the first session, following the VA Office of Connected Care (OCC) guidelines [40]. At the initial meeting, the facilitator will introduce themselves to the participants and review group rules and guidelines (e.g., respect for their peers and facilitator) and the treatment purpose and format. Participants will be provided with session meeting information (date/time and link), and facilitator contact information. LCCR groups will be led by a minimum of two facilitators, including licensed psychologists and/or doctoral-level psychology fellows, and/or bachelor's level psychology technicians supervised by a licensed clinician. The facilitators will receive guidance on handling issues that may arise during the sessions, including off-topic discussion and inflammatory comments, and will be encouraged to use supportive language to foster engagement among the participants.

2.5.2. Feasibility and acceptability

Feasibility data will be evaluated on 1) ease of implementation, 2)

[1] As LCCR primarily targets personal recovery constructs and psychological manifestations of Long COVID, future iterations of this protocol will be updated to emphasize more recovery-centered outcomes rather than physiological outcomes.

recruitment, and 3) attendance/retention rates. Implementation ease will be measured by the number of hours clinicians spend in preparation, delivery, and supervision, with a target of 60 hours per cycle. Recruitment will be measured by rates of successful referrals to LCCR from Long COVID Clinic providers. Attendance and retention rates will be monitored for the total number and specific sessions each Veteran attends. Adequate retention will be determined by a minimum of 70% attendance for at least five of the first eight sessions (Module 1), five of the second eight sessions (Module 2), and 10 of the total 16 sessions (Module 1 and Module 2). Recruitment rates will be considered "adequate" if at least 65% of Veterans approached for participation agree to participate and follow-up response rates of 70% will be considered feasible. These benchmarks align with VA study protocol standards from previous studies [17,30].

To assess acceptability, we will use attendance, satisfaction, and participant feedback. At the end of each session, participants will be asked, "In what ways did you find this session helpful?"; "In what ways could we improve this session?"; and "In what ways could we improve future sessions?" Participants will also complete the Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) [31] at each assessment point. These four-item measures are considered "leading indicators" of implementation success (acceptability and feasibility of intervention and intervention appropriateness) [32]. At the end of the treatment, (during assessment TP-3) additional qualitative questions will be asked to obtain participants' feedback and analyzed for future development purposes.

2.5.3. Facilitators and adherence scale development

Group facilitators will receive weekly supervision from the principal investigator (PI) and participate in audio-taping and session review to refine the LCCR manual. An adherence scale will be created to evaluate the fidelity of the LCCR treatment based on key aspects such as the treatment's structure, content, and principles, and the facilitator's clinical competence (e.g., building rapport with participants). This scale will comprise two elements, covering adherence to (1) general LCCR requirements and (2) session-specific requirements. Scale items will be scored on a Likert scale ranging from 1 (not at all adherent) to 6 (completely adherent).

2.6. Data analytic plan

The de-identified data from the three one-arm trials will be securely stored in a password protected folder accessible only over the VA intranet. The data will then be entered into a Statistical Package for the Social Sciences (SPSS) database at the JJP VAMC. Access to the data-containing computers will be restricted to authorized study personnel only. Preliminary analyses will use descriptive statistics, and outcome measures will be compared across time points using repeated-measures mixed models. As the study aims to develop LCCR and generate hypotheses (rather than test them), conclusions about LCCR's effectiveness won't be drawn from these pilot studies. In line with this, sample size determination followed best practices for clinical pilot studies rather than statistical power [33].

2.7. Stakeholder feedback

The results of the AIM, IAM, and FIM measures and qualitative interviews will be reviewed and shared with stakeholders between each treatment cycle, allowing iterative changes to be made to the treatment approach before starting the next cycle. A written summary of the feasibility and acceptability data will be provided to stakeholders after all three groups have completed the study, with the aim of identifying any changes needed to the LCCR treatment materials or design before submitting a Merit Grant for a large-scale RCT.

3. Discussion

The development of LCCR as a novel mental health intervention for Veterans with Long COVID is an important step forward in addressing the complex multisystemic nature of this condition. Its unique two-pronged treatment approach that targets both building coping skills and recovery-based and identity work toward creating a purposeful life may benefit other chronic illnesses and health conditions beyond Long COVID. Feasibility and acceptability trials are critical in determining its potential benefits, including improved psychological functioning, quality of life, and resilience. Successful implementation of LCCR could have significant implications for improving the quality of life for Veterans with Long COVID and other populations with chronic health conditions.

This pilot study has limitations to consider, such as being conducted in an urban northeast VAMC that may not generalize to other areas of the U.S. Additionally, the recruitment pool consists of a VA population with a high prevalence of military-connected and pre-existing health conditions, which may overlap with Long COVID symptoms. Furthermore, due to the skewed gender ratio of clients seeking care in the VA, the majority of participants may be male, which could limit the generalizability of the findings to female veterans [34]. However, this could also contribute to the literature given the higher risk of Long COVID in females [35,36]. The study's inclusion criteria, allowing for participants who experienced COVID-19 symptoms for one month or longer, is another source of limitation. While this is in line with a universal definition of Long COVID [2], it leads to limitations. Individuals' symptoms could resolve within the first few months after infection, which could inflate the efficacy of the treatment. This is a challenge inherent to Long COVID, as we are still learning more about this condition. In this line, due to the growing understanding of Long COVID [44], future revisions of our criteria may be necessary for the next steps of this research, such as in the planned RCT (randomized controlled trial) follow-up. For instance, we may consider restricting enrollment to those whose symptoms have persisted for a longer duration should more research and/or the one-arm trials indicate that this is appropriate. Finally, the sample sizes selected are within the range considered sufficient for early-stage studies, but they do not allow for testing and drawing conclusions [33,37,38]. By establishing a manualized version of LCCR and conducting further research, we expect to refine this intervention, with our ultimate goal to help give Veterans suffering from Long COVID hope, connection, and a path to recovery. We hope this recovery and identity-focused psychotherapy will provide a model that can be adapted to other chronic health conditions.

Trial status

Currently, the second of three pilot development trials is being administered, and data on feasibility and acceptability is being collected as outlined above.

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Contribution statement

Yosef Sokol: Conceptualization; Funding acquisition; Writing – original draft; Writing – review & editing. **Chana Silver**: Writing – original draft; Writing – review and editing. **Sofie Glatt**: Writing – original draft; Writing – review and editing. **Lakshmi Chennapragada**: Writing – review and editing. **Sarah Andrusier**: Writing – review and editing. **Cameron Padgett**: Writing – review and editing. **Ariana Dichiara**: Conceptualization; Funding acquisition; Writing – review & editing. **Marianne Goodman**: Conceptualization; Funding acquisition;

Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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