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Remotely Administered Resilience- and Wisdom-focused Intervention to Reduce Perceived Stress and Loneliness: Pilot Controlled Clinical Trial in Older Adults

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Abstract

Objectives: Older adults are vulnerable to perceived stress and loneliness, exacerbated by the COVID-19 pandemic. We previously reported inverse relationships between loneliness/perceived stress and wisdom/resilience. There are few evidence-based tele-health interventions for older adults. We tested a new remotely-administered manualized resilience- and wisdom-focused behavioral intervention to reduce perceived stress and loneliness in older adults.

Methods: This pilot controlled clinical trial used a multiple-phase-change single-case experimental design, with three successive 6-week phases: control, intervention, and follow-up

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Author Contributions:

Dr. Jeste designed the study, interpreted data, and prepared the manuscript.
Ms. Glorioso implemented the study, and edited the manuscript.
Dr. Depp interpreted data and edited the manuscript.
Dr. Lee interpreted data and edited the manuscript.
Ms. Daly analyzed and interpreted data and edited the manuscript.
Dr. Jester analyzed and interpreted data and edited the manuscript.
Dr. Palmer interpreted data and edited the manuscript.
Dr. Mausbach reviewed the literature, interpreted data and edited the manuscript.

STATEMENT

The data for this study have not been previously presented orally or by poster at scientific meetings.

Conflicts of interest/Competing interests: The authors have no conflicts of interest to declare that are relevant to the content of this article.

Ethics approval: This study was performed in line with the principles of the Declaration of Helsinki. Approval for the ethical treatment of human subjects was granted by the Office of IRB Administration of University of California San Diego.

periods. The intervention included six once-a-week one-hour sessions. Participants were 20 adults >65 years, without dementia.

Results: All 20 participants completed every session. The study indicated feasibility and acceptability of the intervention. While the sample was too small for demonstrating efficacy, there was a reduction (small-to-medium effect size) in perceived stress and loneliness, and increase in resilience, happiness, and components of wisdom and positive perceptions of aging.

Conclusions: These preliminary data support feasibility, acceptability, and possible efficacy of a remotely-administered resilience- and wisdom-focused intervention in older adults to reduce stress and loneliness.

Keywords

Social isolation; Ageism; Happiness; Depression; Compassion

INTRODUCTION

Stress and loneliness are biologically toxic factors with adverse effects on mental and physical health. The 2018 Gallup World Poll found a 25% to 40% increase in stress, worry, and anger in the US from 2008 to 2018(1). Loneliness is associated with considerable distress(2), and older adults are vulnerable to loneliness due to losses, physical decline, and social isolation. The COVID-19 pandemic led to increased social isolation, though some older adults with higher levels of resilience and wisdom faced the pandemic with greater fortitude than younger adults(3).

Resilience is associated with lower levels of perceived stress(4; S22), and we have reported a significant inverse correlation between loneliness and wisdom(5–7). Both resilience and wisdom are potentially modifiable, using several documented strategies(5,8). Although many interventions to reduce loneliness exist, reviews note poor quality of evidence concerning their effectiveness(9).

A group psychosocial intervention labeled Raise Your Resilience (RYR) reduced perceived stress, and increased resilience and wisdom among 89 residents of retirement communities(8). This intervention focused on promoting positive emotions, savoring experiences, using adaptive coping skills, and discussing the impact of ageism and of strategies to improve perceptions of aging. The RYR was delivered in three 90-minute sessions by trained facility staff. Physical distancing during the pandemic made in-person psychosocial interventions difficult, and while tele-medicine has become widespread, several barriers to online interventions for older adults with loneliness persist(10).

We present preliminary findings from a remotely-administered, manualized resilience- and wisdom-focused behavioral intervention to reduce perceived stress (primary outcome) and loneliness (secondary outcome) in older adults. We added elements of wisdom training to RYR, and adapted it to six one-hour once-a-week sessions delivered remotely. We sought to assess feasibility and acceptability of the intervention, and effect sizes for changes in different measures.

METHODS

The protocol was approved by university's Institutional Review Board. See Supplemental Digital Content 1 for methodological citations.

Study Design:

We used a multiple-phase-change single-case experimental design(S11), which required that each participant serve as their own control in a fixed A-B-C sequence with 3 consecutive 6-week periods: A) control period (weeks 0–6), B) intervention period (weeks 6–12), and C) follow-up period (weeks 12–18). Evaluations were completed at weeks 0 (beginning of control period), and end of weeks 6 (end of control), 12 (end of intervention), and 18 (end of follow-up) by staff who were blind to the participants' trial phase. Unlike the 6 weekly sessions during the intervention period, study staff had no interactions with the participants during control and follow-up periods except for assessments before and after those 6-week periods.

Participants:

Participants were recruited from San Diego County community. Inclusion criteria were fluency in English, age >65 years, possession of a device with videoconferencing capabilities, and informed consent. Those with a diagnosis of dementia or other disabling illnesses that prevented participation were excluded. Among 36 participants who met our selection criteria and consented, 2 dropped out before baseline, 3 during the control period (week 0–6), and 2 after completing the first session, suggesting a 6% attrition rate among those who completed one session. Of the 29 people who completed the 18-week trial, our analysis focused on a subset of 20 participants who had a Perceived Stress Scale (PSS) score of ≥10 both at baseline (week 0) and at the beginning of the intervention (end of week 6), and a UCLA-Third edition Loneliness Scale (UCLA-3) Score of ≥30 at baseline (week 0).

Remote assessment and intervention:

Study assessments and intervention visits were conducted via HIPPA-compliant teleconferencing platform. For individuals who lacked experience with teleconferencing, research staff mailed or emailed them written instructions and conducted remote technology training sessions via telephone.

Measures and procedures:

Sociodemographic characteristics: Self-reported age, sex, race/ethnicity, education, and marital status.

Main outcome measures: 10-item PSS(S12); 20-item UCLA-3(S13); 10-item Connor-Davidson Resilience Scale(S14); 24-item San Diego Wisdom scale(S15) with six components of wisdom: self-reflection, pro-social behaviors, emotional regulation, acceptance of divergent perspectives, decisiveness, and social advising; and Aging Perceptions Questionnaire(S20) with seven dimensions: timeline-chronic and timeline-cyclical, consequences (negative and positive), control (negative and positive), and emotional representation.

Other measures: 20-item Center for Epidemiologic Studies Depression Scale(S16), which includes a 4-item Happiness subscale(S17), 36-item Short Form Health Survey(S18), and Montreal Cognitive Assessment(S19) (MoCA).

Intervention: We developed an intervention manual following discussions with potential participants. The intervention consisted of six one-hour individual-level sessions conducted remotely once-a-week by research staff. The multi-pronged intervention was designed to address three main components of perceived stress and loneliness: A) Cognitive: education about empathy, compassion, self-compassion, loneliness, and attitudes toward aging; and CBT (Cognitive Behavioral Therapy)-informed thought challenging skills to enhance positive perceptions of aging. B) Affective: role plays; mindfulness exercises and meditations; and self-compassion exercises. C) Behavioral: savoring and gratitude practices including a daily gratitude diary; social skills training; engagement in value-based activities; exercises to build self-esteem and self-efficacy; and daily home-based practice of the skills taught during the sessions ("homework" assignments). Sessions were interactive and included deep (diaphragmatic) breathing exercises. In early sessions, therapists assisted participants in identifying and encouraging concrete value-driven activities to achieve their short-term goals for enhancing well-being.

Feasibility and Acceptability: Feasibility and acceptability were measured through the adherence rate and "homework" completion rates.

Statistical Analysis: Paired samples t-tests were used to compare ratings on each scale at the pre- vs. post-control period (weeks 0 vs. 6), intervention period (weeks 6 vs. 12) and follow-up period (weeks 12 vs. 18). Because of the small sample size, we do not present *t*-, or *p*- values, but provide Cohen's *d* with 95% confidence intervals for paired samples t-tests(S21). We defined small-to-medium effect size as $d > 0.30$.

RESULTS

Feasibility and acceptability:

Each of the 20 participants attended every one of the six sessions (100% adherence rate). Regarding completion of the "homework" that was assigned, participants completed CBT-based homework most often (81%), followed by deep (diaphragmatic) breathing (61%), daily journaling (39%), and self-guided meditation (31%) at home during the 6-week intervention period.

Sample Characteristics:

Participants' mean age was 78.3 (SD 7.8) years, and mean MoCA score at baseline was 25.4 (SD 3.8). The sample was 80% female, 85% non-Latinx White; 95% with some college education, and 30% currently married.

Outcomes:

During the control period (week 0 vs. week 6), there was small-to-medium effect size decrease in perceived stress, loneliness, and a component of negative perception of aging

(emotional representations), and increase in self-compassion, physical well-being, and two components of wisdom (emotional regulation and pro-social behaviors; Table 1A).

During the intervention period (week 6 vs. week 12), there was further small-to-medium effect size decrease in perceived stress and loneliness as well as in three components of negative perceptions of aging (timeline acute/chronic, emotional representations, and control negative), and increase in resilience, happiness, two components of wisdom (social advising, emotional regulation), and one component of positive perception of aging (control positive; Table 1B).

During the follow-up period (week 12 vs. week 18) there were no meaningful changes.

DISCUSSION

To our knowledge, this is the first study of a remotely-administered manualized resilience- and wisdom-focused intervention to reduce perceived stress and loneliness in older adults. The attrition rate among participants who completed one session was low (6%) and adherence rate was 100%, indicating high feasibility and acceptability of a remote intervention trial in community-dwelling older adults. Participant engagement with the assigned homework components was strong for CBT-based homework and breathing exercises, but weaker for daily journaling and self-guided meditation exercises.

There were several positive changes during the initial control period, likely reflecting the beneficial psychological effects of attention and care provided by the research staff. The intervention further reduced perceived stress and loneliness and enhanced resilience and components of wisdom as well as positive perceptions of aging, though these findings were underpowered and must be replicated with a larger sample to demonstrate efficacy. The follow-up period produced no meaningful changes, indicating maintenance of the intervention-associated improvement for at least 6 weeks after the end of the intervention.

This study has several limitations. The sample size was small and many effect sizes were small. We did not use traditional randomization or an active control group. However, the study design allowed for examination of changes during a control period and a follow-up period, indicating that the improvements were likely related to the intervention. We did not use *p*-values, although the inclusion of Cohen's *d* improves interpretation. Future studies should include larger and more diverse samples of participants and relevant wearable and environmental sensors to assess objective outcomes.

CONCLUSIONS

This pilot study indicates feasibility, acceptability, and possible efficacy of a novel psychosocial intervention, intended to reduce perceived stress and loneliness in older adults in the community, administered remotely. If these findings are confirmed in larger samples, they would suggest an opportunity to increase accessibility and dissemination of intervention strategies to promote resilience and components of wisdom.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1A:

Comparison of Scores at Week 0 vs. Week 6 - Paired t-tests (N=20)

Assessment Name	N	Week 0 (baseline)		Week 6 (end of control period)			
		Mean	Std Dev	Mean	Std Dev	Cohen's *d*	95% CI
Perceived Stress: PSS	20	17.0	4.5	15.9	4.6	−0.397	[−0.870, 0.065]
Loneliness: UCLA-LS	20	42.1	8.8	40.3	9.1	−0.463	[−0.943, 0.005]
Resilience: CD-RISC	20	27.3	4.1	26.5	5.0	−0.251	[−0.711, 0.203]
Depression: CES-D	20	9.1	4.4	8.8	5.1	−0.098	[−0.550, 0.352]
Happiness: CESD-HS	20	8.4	2.0	7.8	2.9	−0.302	[−0.767, 0.154]
Self-Compassion: Neff-SCS	18	39.9	8.9	43.4	10.3	0.639	[0.126, 1.173]
Mental Health: SF-36 MCS	18	46.4	8.8	47.4	8.2	0.108	[−0.367, 0.586]
Physical Health: SF-36 PCS	18	42.1	10.6	44.8	10.3	0.393	[−0.095, 0.893]
Wisdom: SD-WISE Components							
Social Advising	20	3.8	0.6	3.7	0.6	−0.207	[−0.664, 0.245]
Decisiveness	20	3.5	0.8	3.5	0.7	0.139	[−0.311, 0.593]
Emotional Regulation	20	3.2	0.7	3.4	0.6	0.330	[−0.128, 0.797]
Self-Reflection	20	3.8	0.6	3.8	0.7	0.105	[−0.345, 0.557]
Pro-Social Behaviors	20	4.2	0.5	4.4	0.4	0.543	[0.068, 1.034]
Acceptance of Divergent Perspectives	20	4.2	0.5	4.2	0.5	−0.034	[−0.484, 0.415]
Aging Perceptions: APQ							
Timeline acute/chronic	20	3.0	0.8	3.2	0.8	0.314	[−0.143, 0.779]
Timeline cyclical	20	3.3	0.8	3.1	0.7	−0.370	[−0.841, 0.090]
Emotional Representations	20	2.9	0.7	2.5	0.6	−0.749	[−1.271, −0.250]
Control Positive	20	4.1	0.5	4.0	0.5	−0.293	[−0.757, 0.162]
Control Negative	19	3.6	0.7	3.7	0.5	0.299	[−0.169, 0.776]
Consequences Positive	20	3.8	0.7	3.8	0.6	0.000	[−0.450, 0.450]
Consequences Negative	19	3.0	0.7	3.0	0.6	0.084	[−0.378, 0.548]

Table 1B:

Comparison of Scores at Week 6 vs. Week 12 - Paired t-tests (N=20)

Assessment Name	N	Week 6 (start of intervention)		Week 12 (end of intervention)			
		Mean	Std Dev	Mean	Std Dev	Cohen's *d*	95% CI
Perceived Stress: PSS	20	15.9	4.6	15.1	5.5	−0.324	[−0.790, 0.133]
Loneliness: UCLA-LS	20	40.3	9.1	38.7	9.7	−0.399	[−0.873, 0.063]
Resilience: CD-RISC	20	26.5	5.0	28.2	4.8	0.415	[−0.049, 0.890]
Depression: CES-D	20	8.8	5.1	7.8	5.1	−0.201	[−0.658, 0.251]
Happiness: CESD-HS	20	7.8	2.9	9.1	2.4	0.436	[−0.030, 0.913]
Self-Compassion: Neff-SCS	19	42.7	9.9	43.2	8.7	0.135	[−0.327, 0.601]
Mental Health: SF-36 MCS	20	48.5	8.6	50.5	8.8	0.248	[−0.206, 0.708]
Physical Health: SF-36 PCS	20	44.2	10.0	46.1	9.0	0.198	[−0.254, 0.654]
Wisdom: SD-WISE Components							
Social Advising	20	3.7	0.6	3.9	0.5	0.318	[−0.139, 0.783]
Decisiveness	20	3.5	0.7	3.6	0.8	0.053	[−0.396, 0.504]
Emotional Regulation	20	3.4	0.6	3.5	0.7	0.318	[−0.139, 0.783]
Self-Reflection	20	3.8	0.7	3.8	0.7	0.000	[−0.450, 0.450]
Pro-Social Behaviors	20	4.4	0.4	4.3	0.5	−0.307	[−0.771, 0.150]
Acceptance of Divergent Perspectives	20	4.2	0.5	4.1	0.4	−0.350	[−0.819, 0.109]
Aging Perceptions: APQ							
Timeline acute/chronic	20	3.2	0.8	2.9	1.0	−0.537	[−1.027, −0.062]
Timeline cyclical	20	3.1	0.7	3.1	0.8	0.054	[−0.395, 0.505]
Emotional Representations	20	2.5	0.6	2.3	0.7	−0.406	[−0.880, 0.045]
Control Positive	20	4.0	0.5	4.3	0.5	0.532	[0.058, 1.022]
Control Negative	19	3.7	0.5	3.6	0.6	−0.309	[−0.787, 0.160]
Consequences Positive	20	3.8	0.6	3.9	0.7	0.166	[−0.285, 0.621]
Consequences Negative	19	3.0	0.6	3.0	0.6	−0.114	[−0.579, 0.348]

Table 1C:

Comparison of Scores at Week 12 vs. Week 18 - Paired t-tests (N=20)

Assessment Name	N	Week 12 (start of follow-up)		Week 18 (end of follow-up)			
		Mean	Std Dev	Mean	Std Dev	Cohen's *d*	95% CI
Perceived Stress: PSS	18	14.3	5.2	13.8	4.1	−0.153	[−0.633, 0.323]
Loneliness: UCLA-LS	19	38.8	9.9	40.1	9.2	0.280	[−0.188, 0.755]
Resilience: CD-RISC	19	27.9	4.8	28.2	4.3	0.146	[−0.316, 0.613]
Depression: CES-D	19	8.0	5.2	7.6	4.1	−0.093	[−0.557, 0.369]
Happiness: CESD-HS	19	8.9	2.3	8.5	3.0	−0.209	[−0.679, 0.256]
Self-Compassion: Neff-SCS	18	43.4	8.9	42.9	7.8	−0.090	[−0.568, 0.385]
Mental Health: SF-36 MCS	19	50.6	9.1	51.0	8.0	0.044	[−0.417, 0.507]
Physical Health: SF-36 PCS	19	45.9	9.2	43.8	9.8	−0.343	[−0.824, 0.128]
Wisdom: SD-WISE Components							
Social Advising	19	3.9	0.5	3.9	0.6	0.065	[−0.397, 0.528]
Decisiveness	19	3.5	0.8	3.7	0.8	0.329	[−0.141, 0.808]
Emotional Regulation	19	3.6	0.7	3.6	0.5	0.112	[−0.350, 0.577]
Self-Reflection	19	3.8	0.8	3.8	0.7	−0.048	[−0.511, 0.413]
Pro-Social Behaviors	19	4.3	0.5	4.3	0.6	−0.145	[−0.611, 0.318]
Acceptance of Divergent Perspectives	19	4.1	0.4	4.1	0.5	−0.151	[−0.617, 0.312]
Aging Perceptions: APQ							
Timeline acute/chronic	19	3.0	0.9	3.1	0.9	0.282	[−0.186, 0.757]
Timeline cyclical	19	3.1	0.8	3.1	0.6	−0.067	[−0.531, 0.394]
Emotional Representations	19	2.4	0.6	2.4	0.6	0.134	[−0.329, 0.600]
Control Positive	19	4.2	0.4	3.9	0.5	−0.632	[−1.149, −0.134]
Control Negative	19	3.5	0.6	3.4	0.7	−0.067	[−0.530, 0.395]
Consequences Positive	19	3.9	0.6	4.0	0.7	0.259	[−0.207, 0.733]
Consequences Negative	19	3.0	0.6	2.9	0.7	−0.201	[−0.671, 0.263]

Note: APQ: Aging Perceptions Questionnaire; CES-D: Center for Epidemiological Studies Depression Scale;

CESD-HS: Center for Epidemiological Studies Depression Scale - Happiness Subscale; CD-RISC: Connor-Davidson Resilience Scale;

Neff-SCS: Neff Self-Compassion Scale; PSS: Perceived Stress Scale; SD-WISE: San Diego Wisdom Scale;

SF36-MCS: Short Form 36 Health Survey Questionnaire – Mental Component Score;

SF36-PCS: Short Form 36 Health Survey Questionnaire – Physical Component Score; UCLA-LS: UCLA Loneliness Scale