

PEERS Plus - mHealth Enhanced Peer Support to Reduce Depression Among  
Low-income and Ethnic Minority Older Adults

Study Protocol

NCT05611996

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**Study:**

Feasibility pilot study with approximately 32 participants  
Preliminary analysis of primary (PHQ-9) and secondary outcomes.

**Statistical Analysis**

Baseline characteristics, working alliance scores, and clinical and social outcomes were summarized. The Shapiro-Wilk test was applied to check the normality of each outcome measure. Paired-sample t-tests and Wilcoxon signed-rank test were conducted to assess the differences in outcome measures between baseline and post-study, as well as baseline and three-month follow-up scores, to determine statistical significance. For all analyses, a significance level of  $\alpha = 0.05$  was used for two-sided tests unless otherwise specified.

To assess the change in the primary outcome, depressive symptoms over time within the intervention group, a multilevel linear regression model was employed. This model included fixed effects for time points (e.g., baseline, post-intervention, and follow-ups) and covariates such as baseline loneliness, self-efficacy, working alliance scores, and demographic variables that might influence the intervention effects. Random intercepts and slopes were included to account for the repeated measures within participants, allowing for individual variability in both baseline levels and the trajectories of depressive symptoms over time. Additionally, random effects were specified at the peer coach level to account for the nested structure of the data, where participants were grouped by peer coaches. These analyses and data visualizations were conducted using R Statistical Software (v4.2.1; R Core Team 2022).

PHQ\_9

Model	Timepoint	Estimate	Std. Error	95% CI	p-Value	Effect Size(standardized coefficients)	Marginal R^2
Model 1: Basic	Baseline vs Poststudy	-1.93	0.79	(-3.513, -0.344)	0.018	-0.36	0.049
	Baseline vs 3-mons follow-up	-2.88	0.83	(-4.557, -1.209)	0.001	-0.54	
Model 2: Adjusted for demographics #	Baseline vs Poststudy	-1.93	0.79	(-3.509, -0.348)	0.018	-0.36	0.159
	Baseline vs 3-mons follow-up	-2.81	0.83	(-4.488, -1.137)	0.001	-0.53	
Model 3: Full Model ##	Baseline vs Poststudy	-1.78	0.77	(-3.336, -0.230)	0.025	-0.33	0.276
	Baseline vs 3-mons follow-up	-2.42	0.81	(-4.057, -0.784)	0.005	-0.45	

# Model 2 adjusted for age, gender, education, marital status, race, and employment status.

## Model 3 adjusted for demographic variables and loneliness.

Self-Efficacy

Model	Timepoint	Estimate	Std. Error	95% CI	p-Value	Effect Size(standardized coefficients)	Marginal R^2
Model 1: Basic	Baseline vs Poststudy	2.030	0.824	(0.375, 3.686)	0.017	0.40	0.051
	Baseline vs 3-mons follow-up	2.773	0.870	(1.024, 4.521)	0.003	0.55	
Model 2: Adjusted for demographics #	Baseline vs Poststudy	2.018	0.823	(0.363, 3.673)	0.018	0.40	0.383

	Baseline vs 3-mons follow-up	2.773	0.872	(1.021, 4.525)	0.003	0.55	
Model 3: Full	Baseline vs Poststudy	1.823	0.760	(0.295, 3.351)	0.020	0.48	0.566
	Baseline vs 3-mons follow-up	2.318	0.799	(0.711, 3.926)	0.006	0.55	

# Model 2 adjusted for age, gender, education, marital status, race, and employment status.

## Model 3 adjusted for demographic variables and loneliness.

#### Emotional Well-being

Model	Timepoint	Estimate	Std. Error	95% CI	p-Value	Effect Size(standardized coefficients)	Marginal R^2
Model 1: Basic	Baseline vs Poststudy	6.571	2.668	(1.208, 11.935)	0.017	0.32	0.057
	Baseline vs 3-mons follow-up	12.566	2.869	(6.801, 18.330)	0.000	0.61	
Model 2: Adjusted for demographics #	Baseline vs Poststudy	6.571	2.663	(1.220, 11.923)	0.017	0.32	0.215
	Baseline vs 3-mons follow-up	12.293	2.870	(6.526, 18.060)	0.000	0.60	
Model 3: Full	Baseline vs Poststudy	5.375	2.593	(0.159, 10.591)	0.044	0.26	0.289
	Baseline vs 3-mons follow-up	11.119	2.784	(5.519, 16.720)	0.000	0.54	

# Model 2 adjusted for age, gender, education, marital status, race, and employment status.

## Model 3 adjusted for demographic variables and loneliness.

#### Social Function

Model	Timepoint	Estimate	Std. Error	95% CI	p-Value	Effect Size(standardized coefficients)	Marginal R^2
Model 1: Basic	Baseline vs Poststudy	5.804	4.656	(-3.557, 15.164)	0.219	0.20	0.068

	Baseline vs 3-mons follow-up	18.775	4.994	(8.740, 28.809)	0.001	0.65	
Model 2: Adjusted for demographics #	Baseline vs Poststudy	5.804	4.648	(- 3.539, 15.146)	0.218	0.20	0.304
	Baseline vs 3-mons follow-up	18.385	5.004	(8.329, 28.441)	0.001	0.64	
Model 3: Full Model ##	Baseline vs Poststudy	5.926	4.612	(- 3.350, 15.202)	0.205	0.21	0.385
	Baseline vs 3-mons follow-up	16.447	4.944	(6.504, 26.390)	0.002	0.57	

# Model 2 adjusted for age, gender, education, marital status, race, and employment status.

## Model 3 adjusted for demographic variables and loneliness.