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ORIGINAL ARTICLE

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Abstract

In the United States, 21 million adults are diagnosed with depression. Couple therapy effectively treats depression, however, couples encounter access barriers. The Relationship Checkup is an assessment and feedback intervention delivered in participants' homes. The current study examines changes in relationship satisfaction and depressive symptoms, and moderators and mechanisms of change in a community sample ($N = 85$ couples). Changes in depressive symptoms and satisfaction, and the association between changes in satisfaction and depressive symptoms were examined with multilevel modeling. Depressive symptoms (Cohen's $d = 0.36$) and satisfaction ($d = 1.43$) improved from baseline to 1-month follow-up, with greater

declines in depression ($d = 0.44$) for those with more severe symptoms. Increases in satisfaction were associated with decreases in depressive symptoms ($d = 0.23$), and decreases in depressive symptoms were associated with increases in satisfaction ($d = 0.33$). Individuals with depression and relationship distress may be well served by this intervention.

KEYWORDS

brief intervention, couples, depressive symptoms, relationship satisfaction

INTRODUCTION

Depression is one of the most frequently diagnosed mental health disorders with around 21 million adults diagnosed in the United States (National Institute of Mental Health, 2022). Relationship distress has been well established as a risk factor for depressive symptoms (e.g., Barton et al., 2022; Whisman et al., 2021), and individuals with a depressed partner report lower relationship satisfaction and intimacy, and more destructive communication (Jenkins et al., 2019; Sharabi et al., 2016). Couple therapy can be effective for improving depressive symptoms and relationship satisfaction (Alder et al., 2018; Baucom et al., 2018; Durães et al., 2020), and has been shown to be equally as effective as individual psychotherapy for reducing depressive symptoms (Barbato & D'Avanzo, 2020). However, couple therapy is often inaccessible due to various barriers (e.g., time, cost, transportation, and childcare). Brief interventions delivered in flexible settings (e.g., participants' homes and community clinics) may reduce some of the barriers to couple therapy and reach more couples in need.

Evaluation of a brief, problem-focused intervention delivered in 5, 2-h sessions to couples with a female partner diagnosed with depression found that women in the treatment group experienced improvements in depressive symptoms and marital satisfaction compared to waitlist control participants (Cohen et al., 2010). The positive change in women's depression-related behaviors and attitudes completely mediated the improvements in marital satisfaction (Cohen et al., 2014). Couples who participated in OurRelationship, an 8-h online program with 1 h of supplemental phone coaching, reported improvements in depressive symptoms and relationship satisfaction, and the reduction in depressive symptoms was greater for individuals reporting clinical levels of depression at baseline (Doss et al., 2016). In an even briefer two-session intervention totaling 3 h, the Marriage Checkup, participants reported declines in depressive symptoms, with even greater reductions for participants reporting more severe depressive symptoms at baseline. Additionally, relationship satisfaction mediated the treatment effect on depressive symptoms. There were not enough same-sex couples ($n = 6$) to make meaningful inferences and thus were excluded from the analysis (Gray et al., 2019). While the finding from Gray et al. (2019) aligns with early research demonstrating that changes in relationship satisfaction precede changes in depressive symptoms (Beach & O'Leary, 1992; Jacobson et al., 1991), this direction of effect is not substantiated for all couples. One study of Emotionally Focused Couple Therapy (EFT) found that for some couples, a change in

depressive symptoms predicted a change in relationship satisfaction, while the opposite was true for other couples (Wittenborn et al., 2019). Thus, more research is needed on the associations between changes in relationship satisfaction and depressive symptoms, as interventions targeting improvements in satisfaction may offer an effective avenue for reducing depressive symptoms.

The intervention

The Marriage Checkup is a two-session intervention designed to be the relationship equivalent of a physical health checkup. The Checkup consists of an assessment session (about 90 min) followed by a feedback session (about 90 min). The Checkup is informed by principles of Integrative Behavioral Couple Therapy (Jacobson & Christensen, 1996) and Motivational Interviewing (Miller & Rollnick, 2002). The Checkup (a) assesses the couple's relationship history, (b) highlights the couple's strengths, and (c) provides research-based suggestions to address the couple's concerns. Each partner identifies a short list of primary concerns in their relationship. Thus, the intervention is adaptable to each couple's unique needs and can be adapted across diverse populations. A randomized controlled trial found that participants experienced significant gains in acceptance, intimacy, and relationship satisfaction (Cordova et al., 2014). While the Marriage Checkup can reduce access barriers to relationship help for all couples (Morrill et al., 2011), studies to date have primarily been conducted in University, private practice, or primary care settings, and have included majority White, higher income, and highly educated samples (Cordova et al., 2014; Gray et al., 2019). The Marriage Checkup was (a) modified for cohabitating couples as well as married couples, (b) delivered as a home visitation program or in a community setting the couple was familiar with (as opposed to a research lab) with childcare provided as needed, (c) was renamed the Relationship Checkup, and (d) changed the feedback's emphasis "on the basis of research" to "other couples have found these suggestions helpful" as research-based suggestions were not as compelling of a motivation for this population (Gordon et al., 2019). These modifications aimed to reduce common barriers that prohibit couples from seeking help. Couples who participated in the Relationship Checkup reported significant improvements in satisfaction, communication, and relational aggression (Coop Gordon et al., 2019). The Relationship Checkup was selected for the current study given its brevity (3 h of intervention) and delivery as a home visitation program, thus reducing many of the common barriers to accessing couple therapy.

Present study

The current study examines changes in relationship satisfaction and depressive symptoms from baseline to 1-month follow-up for couples who participated in the Relationship Checkup. This study also includes moderators (i.e., level of depressive symptoms at baseline) and mechanisms of change (i.e., associations between changes in satisfaction and depressive symptoms). This study aims to replicate the work of Gray et al. (2019) with a community sample of participants (men and women) across income levels. Our hypotheses are as follows:

Hypothesis 1. Participant-reported depressive symptoms will decrease from baseline to 1-month follow-up.

Hypothesis 2. Similar to previous findings (Doss et al., 2016; Gray et al., 2019), we expect participant-reported depressive symptoms at baseline will moderate the change in participant-reported depressive symptoms from baseline to 1-month follow-up.

Hypothesis 3. Participant-reported relationship satisfaction will increase from baseline to 1-month follow-up.

Hypothesis 4. The change in participant-reported relationship satisfaction will be associated with the change in participant-reported depressive symptoms from baseline to 1-month follow-up.

MATERIALS AND METHODS

Procedures

The data for this study were obtained from a year-long extension (2014–2015) of a larger study (2011–2015) evaluating the Relationship Checkup in which new measures were added to an existing assessment. The Institutional Review Board at the University of Tennessee, Knoxville approved this research. Participants were recruited in the Southeastern region of the United States through various methods including flyers, community organizations and events (with intentionality toward those that served or targeted couples with low income), social media advertisements, and referrals from family members and friends. Study advertisements emphasized the importance of relationship health, including physical health benefits and positive outcomes for children. Enrolled participants were in a self-identified committed relationship (cohabitating or married) and both partners were at least 18 years old. In consultation with the local Family Justice Center, couples were screened for severe couple-level violence; if present, couples were referred to local resources using methods developed with input from the Family Justice Center. First, participants completed informed consent and a baseline questionnaire packet. Next, couples participated in the Checkup's assessment session with a trained facilitator and approximately 1 week later completed the feedback session with that same facilitator. The creator of the Relationship Checkup, Dr. James Cordova (coauthor), and a senior facilitator watched videotapes of the check-ups each week and conducted weekly group supervision to ensure that the facilitators were adhering to the check-up's format. Approximately 1-month after the feedback session, participants completed a series of follow-up questionnaires. Participants were compensated up to $100 (see Coop Gordon et al., 2019 for more information). Couples in the current study participated in a later round of data collection that included a measure of depressive symptoms; six couples did not complete the follow-up assessment at 1-month after the feedback session.

Participants

Participants ($N = 85$ intimate partner dyads; $N = 170$ individuals) reported demographic information at baseline. Fifty-one percent of participants identified as men, and 89% of couples identified as heterosexual. Sixty percent of participants were married and 46% had children. Seventy-five percent of participants were White, 19% were Black, and less than 5% were Pacific

Islander, Native American, or Asian. Ninety-four percent of participants identified as Non-Hispanic/Latinx. Forty-one percent of participants were between 25 and 34 years old, 24% were between 35 and 44 years old, 14% were between 45 and 54 years old, 13% were between 18 and 24 years old, 5% were between 55 and 64 years old, and 4% were over 64 years old. Approximately 32.7% of couples lived at or under the poverty line, with the median annual household income between $10,000 and $19,000, and the mode being no annual income. Thirty-seven percent of participants worked full-time, 26% were unemployed, 12% were on disability, 11% worked part-time, 7% were students, and 5% were retired. Fifty-six percent of participants earned a high school diploma/GED or less, 21% earned a vocational/technical certificate or associate's degree, 15% earned a bachelor's degree, and 8% earned a master's degree.

Measures

Depressive symptoms

Depressive symptoms were measured with the Center for the Epidemiological Studies Depression (CES-D; Andresen et al., 1994), a 10-item scale measuring depressive symptoms. Participants respond to each item on a Likert scale from 1 (*rarely*) to 4 (*almost always*). Total scores range from 0 to 30, with higher scores indicating more depressive symptoms. Typical items include, "I was bothered by things that usually don't bother me" and "I felt that everything I did was an effort." The CES-D has been validated with an economically disadvantaged sample (Thomas et al., 2001). Using the recommended cutoff score of 11 (Björgvinsson et al., 2013), 30.6% of participants reported clinical levels of depression at baseline. In the present study, the CES-D had acceptable internal consistency (baseline: $\alpha = 0.75$; 1-month follow-up: $\alpha = 0.71$).

Relationship satisfaction

Relationship satisfaction was measured with the Couple Satisfaction Index (CSI-16; Funk & Rogge, 2007), a 16-item self-report scale of relationship satisfaction. The CSI-16 is correlated with other measures of satisfaction ($r = 0.89$–0.96), and can appropriately distinguish between non-distressed and distressed relationships (Funk & Rogge, 2007). Total scores range from 0 to 81; higher scores indicate greater satisfaction. Typical items include, "Please indicate the degree of happiness, all things considered, of your relationship" and "I have a warm and comfortable relationship with my partner." Using the recommended cutoff score of 51.5 (Funk & Rogge, 2007), 7.1% of participants reported relationship distress at baseline. In this study, the CSI-16 demonstrated excellent internal consistency (baseline: $\alpha = 0.94$; 1-month follow-up: $\alpha = 0.95$).

Control variables

Individual- and couple-level control variables associated with patterns of attrition (Coop Gordon et al., 2019) are included. The individual-level control variables are gender (self-reported as $0 = man$ or $1 = woman$) and minority status (coded as $0 = White$ or $1 = Black$,

Hispanic, Asian, other). The couple-level control variables are marital status (self-reported as $0 = married$ or $1 = not married$), parenting status (self-reported number of children under 18 living in the home: $0 = no children$ and $1 = 1$ *or more children*), and poverty status, which was calculated on the total household annual income (sum of both partners individual annual incomes), the number of household members, and the 2016 poverty threshold ($0 = above the poverty line$, $1 = at/below the poverty line$).

Analytic strategy

We test a series of three-level multilevel models in Mplus 8.1 (Muthén & Muthén, 1998–2017). Level 1 is the time-varying level, level 2 is the individual level, and level 3 is the couple level. We use the three levels to model time nested within individuals nested within couples, which allows us to model the random effects of time while accounting for the dependence of the dyadic data. We fixed the intercepts at the second and third levels to increase degrees of freedom. We examine depressive symptoms and relationship satisfaction at the individual level at baseline and 1-month follow-up. Given the small proportion of same-sex couples in our sample (11%), we did not have the statistical power to meaningfully compare differences between same-sex and different-sex couples.

For Hypothesis 1, to test change in participant-reported depressive symptoms from baseline to 1-month follow-up, we conduct a three-level multi-level model with depressive symptoms regressed onto "time" ($0 = baseline$, $1 = 1\text{-}month\ follow\text{-}up$) in the first level. Individual-level control variables were included in the second level and the couple-level control variables were included in the third level. In addition, we use a Maximum Likelihood Robust (MLR) estimator to reduce estimation bias due to nonnormally distributed outcome variables.

For Hypothesis 2, we examine how baseline depressive symptoms moderate the change in depressive symptoms from baseline to 1-month follow-up. We build upon the model from Hypothesis 1 and regress the change in depression (i.e., change from baseline to 1-month follow-up) onto depressive symptoms in the second level of the multi-level model.

For Hypothesis 3, to test change in participant-reported relationship satisfaction from baseline to 1-month follow-up, we conduct a three-level multi-level model similar to Hypothesis 1 with the MLR estimator. We regress relationship satisfaction onto "time" ($0 = baseline$, $1 = 1\text{-}month\ follow\text{-}up$) in the first level and include the same individual-level control variables in the second level and the same couple-level control variables in the third level.

For Hypothesis 4, we build on the model by combining the depressive symptom and relationship satisfaction models. We conduct a three-level multi-level model with a MLR estimator where we regress both depressive symptoms and relationship satisfaction on to time resulting in two random effects (i.e., change in depressive symptoms and relationship satisfaction) in level two (individual level) of the model. We regress the change in depressive symptoms from baseline to 1-month follow-up on the change in relationship satisfaction from baseline to 1-month follow-up. The intercept is fixed because of limitations with degrees of freedom. Due to the smaller sample size and non-normally distributed variables, we use a Monte Carlo integration.

Finally, we examine a post hoc explanation of the association between changes in relationship satisfaction and depressive symptoms from baseline to 1-month follow-up. To examine if this could be explained in the inverse direction, we conduct a similar three-level

multilevel model as described above; however, we regress the change in relationship satisfaction from baseline to 1-month follow-up onto the change in depressive symptoms from baseline to 1-month follow-up. We use the same control variables and estimators. To compare the models and determine significance, we examine (a) statistical significance ($p < 0.05$; 95% confidence intervals [CIs]) whereby a statistically significant parameter estimate indicates the likely direction of effect, (b) effect sizes whereby a larger effect size (Cohen's d) indicates the likely direction of effect and adhere to standard Cohen's d cutoffs (small effect = 0.20, medium effect = 0.40, large effect = 0.80), and (c) Akaike information criteria (AIC) whereby the model with a smaller value indicates the likely direction of effect (Tredennick et al., 2021). Control variables in all models were included on the appropriate level.

Transparency and openness

We follow Journal Article Reporting Standards for quantitative research (Appelbaum et al., 2018). Specifically, we report how our sample size was determined, data exclusions (if any), all manipulations, and all measures in the study. All deidentified data, code, and research materials are available upon request. Data were analyzed in MPlus (Muthén & Muthén, 1998–2017). This study's design and its analysis were not preregistered.

RESULTS

Our preliminary bi-variate correlations range from 0.002 to 0.78 (see Table 1). We did not explore gender differences in any of our analyses. We had a 76% retention rate at the 1-month follow-up assessment. Identifying as Latino/a ($X^2[1] = 12.22$, $p < 0.001$) and having more children ($r = 0.25$, $p < 0.001$) were linked to lower retention but gender, employment status, income, and age were not linked to retention. Findings may not be generalizable to couples with more children or when one or both partners identify as Latino/a.

For Hypothesis 1, we tested the change in participant-reported depressive symptoms from baseline to 1-month follow-up. As expected, depressive symptoms decreased from baseline to 1-month follow-up ($B = -0.08$, SE = 0.02, $p < 0.001$, Cohen's $d = 0.36$, 95% CIs $[-0.11, -0.04]$; individual level intraclass correlation [ICC] = 0.009; Couple Level ICC = 0.611). For Hypothesis 2, we examined how baseline depressive symptoms moderate the change in depressive symptoms from baseline to 1-month follow-up. As hypothesized, participants with higher depressive symptoms at baseline reported greater declines in depressive symptoms from baseline to 1-month follow-up ($B = -0.20$, SE = 0.04, $p < 0.001$, Cohen's $d = 0.44$, 95% CIs $[-0.28, -0.11]$; individual Level ICC = 0.009; couple level ICC = 0.611), whereby higher levels of depressive symptoms at baseline were linked with greater improvements in depressive symptoms at 1-month follow-up.

For Hypothesis 3, we tested the change in participant-reported relationship satisfaction. As expected, relationship satisfaction increased from baseline to 1-month follow-up ($B = 0.16$, SE = 0.01, $p < 0.001$, Cohen's $d = 1.43$, 95% CIs [0.15, 0.17]; individual level ICC = 0.001; couple level ICC = 0.749).

Finally, for Hypothesis 4, we tested if a change in relationship satisfaction preceded a change in depressive symptoms. As hypothesized, change in relationship satisfaction is significantly linked to change in depressive symptoms ($B = -0.87$, SE = 0.34, $p < 0.05$, Cohen's

TABLE 1 Correlations among context variables of interest at baseline and 1-month follow-up assessments (means and standard deviations are presented in the diagonal for continuous variables and proportions are presented in the diagonal for binary variables).

	Baseline depressive symptoms	Baseline satisfaction	1-month depressive symptoms	1-month satisfaction	Gender	Marital status	Parenting status	Minority status	Poverty status
Baseline depressive symptoms	1.93 (0.58)								
Baseline satisfaction	−0.52**	4.48 (0.95)							
1-month depressive symptoms	0.63**	−0.46**	1.86 (0.56)						
1-month satisfaction	−0.44**	0.78**	−0.47**	4.64 (0.98)					
Gender	0.11	−0.16*	0.05	−0.08	Men: 51% Women: 49%				
Marital status	−0.17	0.006	0.02	−0.04	0.03	Cohabiting: 40% Married: 60%			
Parenting status	−0.09	−0.03	−0.05	0.008	−0.02	−0.38**	Parent: 46% Nonparent: 54%		
Minority status	0.07	0.06	−0.04	0.11	0.004	−0.12	0.02	Minority: 25% White: 75%	
Poverty status	0.17*	−0.16*	0.11	−0.06	0.002	−0.22*	0.17	0.24**	Under poverty: 33% Above poverty: 66%

**Correlation is significant at the 0.01 level (two-tailed).

*Correlation is significant at the 0.05 level (two-tailed).

$d = 0.23$, 95% CIs [-1.54, -0.20]; AIC: 1025.889), where an increase in relationship satisfaction was associated with a large decline in depressive symptoms from baseline to 1-month follow-up. For Hypothesis 4, relationship satisfaction ICC equaled 0.004 (individual level) and 0.751 (couple level), and depression ICC equaled 0.008 (individual level) and 0.616 (couple level).

Further, we tested a post hoc hypothesis that change in depressive symptoms proceeded change in relationship satisfaction. Results show that decreases in depressive symptoms were significantly associated with increases in relationship satisfaction ($B = -0.08$, SE $= 0.02$, $p < 0.001$, Cohen's $d = 0.33$, 95% CIs [-1.76, -0.53]; AIC: 1025.889; see Table 2). For this post hoc test, the ICC was the same as Hypothesis 4: relationship satisfaction ICC equaled 0.004 (individual level) and 0.751 (couple level) and depression ICC equaled 0.008 (individual level) and 0.616 (couple level).

Thus in this sample, increases in relationship satisfaction are associated with decreases in depressive symptoms, and decreases in depressive symptoms are associated with increases in relationship satisfaction. Additionally, according to the information criteria (AIC), the originally hypothesized model (AIC: 1025.8894) and the post hoc model (AIC: 1025.889; Tredennick et al., 2021) are the same. While the effect size for the post hoc model is slightly smaller, this difference is so small it is likely not a statistically significant difference.

DISCUSSION

Findings from the current study suggest that a brief assessment and feedback intervention, like the Relationship Checkup, delivered in participants' homes can improve mental health and relationship functioning for couples across income levels. The current study replicated prior research demonstrating the Checkup is effective for improving depressive symptoms and relationship satisfaction (Gray et al., 2019), and extended these findings across income levels. It is imperative that we test mechanisms of change across income levels before applying these interventions to couples across the income spectrum. Additionally, our findings support the notion that brief relationship interventions can improve depressive symptoms even for individuals reporting more severe depressive symptoms at baseline (Doss et al., 2016; Gray et al., 2019), and support associations between improvements in relationship satisfaction and depressive symptoms (Cohen et al., 2014; Gray et al., 2019). Further, these findings extend prior research with a community sample that included more couples with low income compared to previous studies.

As hypothesized, depressive symptoms and relationship satisfaction significantly improved from baseline to 1-month follow-up. These findings align with prior research (Cohen et al., 2010; Doss et al., 2016; Gray et al., 2019), and expand the generalizability of prior findings by including both partners (Cohen et al., 2010) in a more representative sample compared to some previous studies (Cohen et al., 2010; Gray et al., 2019). Compared to research conducted by Gray et al. (2019) on the Marriage Checkup, effect sizes in the current study were larger for improvements in depressive symptoms (current study: $d = 0.36$; Gray et al., 2019: $d = 0.20$ at 6-month follow-up), and were smaller for individuals with more severe baseline depressive symptoms (current study: $d = 0.44$; Gray et al., 2019: $d = 0.63$ at 6-month follow-up). The overall effects on depressive symptoms are encouraging, and even the small-sized impact of this intervention is noteworthy given that this was a community sample that oversampled couples with low income. Couples with low income have fewer resources to overcome common barriers to accessing relationship health services (Williamson et al., 2019), and could benefit from

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TABLE 2 Parameter estimates for models testing Hypotheses 1–3 including the post hoc analyses ($N = 85$ intimate partner dyads; $N = 170$ individuals).

	B (SE)	Cohen's *d*	95% confidence interval
Hypothesis 1: Change in depression			
Level 1			
Gender	0.09 (0.30)	0.03	−0.50, 0.69
Minority status	−0.06 (0.005)**	1.07	−0.07, 0.05
Level 2			
Intercept mean	1.92 (0.51)**	0.34	0.93, 2.92
Slope mean	−0.08 (0.02)**	0.36	−0.11, −0.04
Level 3			
Poverty status	0.38 (0.10)**	0.34	0.12, 0.22
Marital status	−0.06 (0.02)**	0.27	−0.09, −0.03
Parenting status	0.01 (0.03)	0.03	−0.01, 0.04
Hypothesis 2: Baseline depression moderates change in depression			
Level 1			
Gender	0.05 (0.22)	0.02	−0.37, 0.47
Minority status	−0.04 (0.04)	0.09	−0.12, 0.03
Level 2			
Intercept mean	1.98 (0.38)**	0.47	1.24, 2.71
Intercept → Slope	−0.20 (0.04)**	0.44	−0.28, −0.11
Level 3			
Poverty status	0.38 (0.10)**	0.34	0.17, 0.59
Marital status	−0.06 (0.02)*	0.27	−0.10, −0.02
Parenting status	0.01 (0.03)	0.04	−0.04, 0.07
Hypothesis 3: Change in relationship satisfaction			
Level 1			
Gender	−0.29 (0.30)	0.09	−0.62, 0.03
Minority status	0.26 (0.10)*	0.23	0.00, 0.60
Level 2			
Intercept mean	4.52 (0.12)**	3.37	4.28, 4.75
Slope mean	0.16 (0.01)**	1.43	0.15, 0.17
Level 3			
Poverty status	−0.41 (0.43)	0.08	−1.52, 0.44
Marital status	−0.04 (0.09)	0.04	−0.22, 0.14
Parenting status	0.02 (0.19)	0.01	−0.35, 0.39

TABLE 2 (Continued)

	B (SE)	Cohen's d	95% confidence interval
Hypothesis 4: Relationship satisfaction change precedes depression change			
Level 1			
Relationship satisfaction			
Gender	−0.25 (0.30)	0.07	−0.83, 0.34
Minority status	0.26 (0.11)*	0.21	0.05, 0.48
Depression			
Gender	0.06 (0.23)	0.02	−0.39, 0.52
Minority status	−0.06 (0.04)	0.13	−0.04, 0.02
Level 2			
Intercept relationship satisfaction	4.48 (0.33)**	1.21	3.83, 5.14
Intercept depression	1.98 (0.41)**	0.43	1.17, 2.79
Change relationship satisfaction → Change in depression	−0.87 (0.34)*	0.23	−1.54, −0.20
Level 3			
Relationship satisfaction			
Poverty status	−0.36 (0.44)	0.07	−1.23, 0.50
Marital status	−0.06 (0.11)	0.05	−0.27, 0.15
Parenting status	0.03 (0.18)		−0.34, 0.39
Depression			
Poverty status	0.30 (0.10)*	0.01	0.11, 0.50
Marital status	−0.06 (0.03)	0.18	−0.12, 0.004
Parenting status	0.01 (0.03)	0.03	−0.04, 0.06
Hypothesis 4 (post hoc): Depression change precedes relationship satisfaction change			
Level 1			
Relationship satisfaction			
Gender	−0.25 (0.30)	0.07	−0.83, 0.34
Minority status	0.26 (0.10)*	0.23	0.07, 0.46
Depression			
Gender	0.06 (0.23)	0.02	−0.39, 0.52
Minority status	−0.06 (0.04)	0.13	−0.14, 0.02
Level 2			
Intercept relationship satisfaction	4.48 (0.31)**	1.29	3.87, 5.09
Intercept depression	1.98 (0.41)**	0.43	1.17, 2.79

(Continues)

TABLE 2 (Continued)

	B (SE)	Cohen's d	95% confidence interval
Change in depression → Change in relationship satisfaction	−0.08 (0.02)**	0.33	−1.76, −0.53
Level 3			
Relationship satisfaction			
Poverty status	−0.36 (0.44)	0.07	−1.49, 0.50
Marital status	−0.06 (0.10)	0.05	−0.26, 0.14
Parenting status	0.03 (0.18)	0.01	−0.33, 0.38
Depression			
Poverty status	0.30 (0.10)*	0.27	0.11, 0.50
Marital status	−0.06 (0.03)	0.17	−0.12, 0.001
Parenting status	0.01 (0.02)	0.04	−0.04, 006

$**p < 0.001$; $*p < 0.05$.

interventions that reduce barriers to access while also improving relationship quality and mental health. Thus, the Checkup delivered in participants' homes may offer an effective avenue of intervention for individuals presenting with depressive symptoms, particularly when other forms of support may not be accessible.

About one-third of participants reported clinically significant levels of depressive symptoms at baseline, which is commensurate with rates found in other studies with community samples (e.g., Sareen et al., 2011). As hypothesized, participants with more severe depressive symptoms experienced greater declines in depressive symptoms through 1-month follow-up. While some may question the clinical utility of this very brief intervention for individuals with more severe depressive symptoms, our study found that this intervention can actually improve symptoms at greater rates for individuals who are experiencing more severe depressive symptoms. This finding replicates prior research (Gray et al., 2019) and increases the generalizability across income levels. In consideration of the multiple barriers that couples face when seeking couple therapy (e.g., time, cost, transportation, and childcare), this brief home visitation intervention should be considered even for individuals with more severe depressive symptoms.

We also examined change processes for depressive symptoms and relationship satisfaction through 1-month posttreatment. About 30% of our sample reported a baseline score in the clinical range for depressive symptoms, while about 7% of our sample reported a baseline score above the clinical cutoff for relationship distress. In support of our fourth hypothesis, improvements in relationship satisfaction were associated with improvements in depressive symptoms ($d = 0.23$). Thus, targeting improvements in relationship quality, as is often the case with relationship-focused interventions like the Checkup, may have significant secondary benefits to individual mental health, such as improving depressive symptoms, and further supports this association in the literature (Whisman et al., 2012). Gray et al. (2019) similarly found the decline in depressive symptoms was dependent upon an increase in relationship satisfaction with couples receiving the Marriage Checkup. Our study increases the generalizability of this finding across income levels and further supports the potential utility of this

brief assessment and feedback intervention, which may be more accessible compared to couple therapy, affecting change in individual mental health outcomes.

Additionally, post hoc analysis potentially supports the reverse effect in which there is an association between the decrease in depressive symptoms and the increase in relationship satisfaction. Prior research found this association to be true for some but not all couples (Cohen et al., 2014; Gray et al., 2019); however, these studies have included primarily higher-income samples. Our findings suggest that the association between increases in relationship satisfaction and decreases in depressive symptoms, and the association between decreases in depressive symptoms and increases in relationship satisfaction is present across income levels. While some prior research has not found associations regarding changes in these variables, this finding makes sense when situated in the literature that clearly demonstrates bidirectional associations between the presence of depressive symptoms and relationship distress (Jenkins et al., 2019; Sharabi et al., 2016; Whisman et al., 2021). Therefore, it is likely that targeting improvements in one of these facets may influence improvements in the other—a finding that further supports the effectiveness of couple-based interventions for improving individual mental health, and extends this to a very brief intervention delivered in participants' homes. More research, especially with participants across income levels, longer follow-ups, and the inclusion of a control group, is warranted.

Clinical implications

Findings from the current study support the effectiveness of the Checkup for reducing depressive symptoms and improving relationship satisfaction, even for individuals reporting more severe depressive symptoms at baseline. Thus, this brief intervention should be considered by clinicians for clients who present with clinical levels of depressive symptoms and relationship distress concurrently. Our findings suggest the Checkup, as a stand-alone intervention, could offer enough improvement in depressive symptoms and relationship distress for optimal functioning. Alternatively, the Checkup could provide a first step to treatment, and help the clinician (and clients) determine if a more extensive form of couple therapy is warranted to fully address the presenting mental and relationship health symptoms. In consideration of the extensive need for couple therapy, and the capacity of couple therapists across the country to meet this need, this brief intervention could offer an effective alternative to a longer-term, more intensive form of couple therapy requiring more resources from both the clinician and their clients.

Limitations

Despite contributions to the current literature, there are identified limitations. First, the data for this study came from a larger implementation grant that prohibited a waitlist or other control groups. Future research should examine these associations in a similarly brief relationship health intervention with couples with low income and the inclusion of a control group. It is notable that Gray et al. (2019) found similar results in a study that did include a waitlist control group, however, further research is needed. Second, while this study included more couples with low income and had a larger percentage of Black participants than previous studies of brief relationship interventions, Asian, Pacific Islander, Native American, and Hispanic participants were underrepresented. We also had a very small number of participants

in same-sex relationships, which limited our ability to explore similarities and differences among same-sex and different-sex couples in the current study. Future research should replicate these mechanisms' findings with these marginalized populations. Third, less than one-third (30.6%) of our sample reported clinical levels of depressive symptoms at baseline. It is notable that Gray et al. (2019) had a similar percentage of participants report clinical levels of depression at baseline, and these rates are commensurate with levels of depression reported in community samples with low income (Sareen et al., 2011). However, future research should test these associations with a more clinically depressed, economically disadvantaged sample. Finally, the data for the current study was only collected across two time points through 1-month follow-up. This limits our ability to observe if improvements in relationship satisfaction and depressive symptoms were maintained following this brief intervention. Additionally, these two time points limit our ability to attribute causal inferences in the direction of effect. Future research should test this brief intervention with couples with low income and with multiple, longer-term follow-ups.

CONCLUSION

The Relationship Checkup may be effective for reducing depressive symptoms and improving relationship satisfaction for couples across income levels. Findings indicated that participants with more severe depressive symptoms reported greater improvements in depressive symptoms over time, suggesting that this brief intervention may also be appropriate for more clinically depressed samples. Further, findings supported the associations between improvements in relationship satisfaction and depressive symptoms, and improvements in depressive symptoms and relationship satisfaction from baseline to 1-month follow-up. Thus individuals reporting depressive symptomatology, even those with symptoms in the clinical range, may experience improvements in these symptoms after attending a brief and accessible relationship health intervention like the Relationship Checkup.

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