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Cognitive-Behavioral Stress Management and Psychological Well-Being in HIV+ Racial/Ethnic Minority Women with Human Papillomavirus

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Abstract

Objective—This study is a secondary analysis examining the effects of a cognitive behavioral stress management (CBSM) intervention on indicators of positive psychological well-being and negative psychological well-being in HIV-positive racial/ethnic minority women at risk for cervical cancer due to Human Papillomavirus (HPV) infection and/or cervical intraepithelial lesions (CIN).

Methods—Racial/ethnic minority women with HIV and HPV and/or CIN I were randomized to a 10-week CBSM group or a 1-day psychoeducational seminar. Participants completed a battery of measures of positive and negative psychological well-being at three time points: pre-intervention (Time 1 [T₁]), three months post-enrollment (Time 2 [T₂]), and nine months post-enrollment (Time 3 [T₃]).

Results—Women in the CBSM group reported significant increases in domains of positive well-being, with no changes among women in the psychoeducational seminar ($F[6, 63] = 2.42, p < .05, \eta^2 = 0.19$). There were no significant changes in domains of negative well-being across time for either group ($F[2, 65] = 2.60, p = .08, \eta^2 = 0.07$).

Conclusions—These findings suggest that racial/ethnic minority women with HIV at risk for cervical cancer who were randomized to a 10-week CBSM group experienced enhanced positive well-being. The lack of effects on negative well-being may be due to the relatively low levels of negative well-being present in this sample at study entry. Future research should examine whether these effects are replicated in a randomized controlled trial of women with biopsy-confirmed CIN who present with greater distress levels that also employs a time-equivalent comparison condition.

Keywords

HIV; HPV; CIN; cervical cancer; stress management; psychological well-being

Introduction

Women of color are disproportionately affected by HIV/AIDS (Centers for Disease Control and Prevention, 2009), who in turn have over 60% prevalence of high-risk Human Papillomavirus (HPV) infection, a cervical cancer risk factor (Fife et al., 2009; Markowitz, Sternberg, Dunne, McQuillan, & Unger, 2009). Negative psychological well-being is associated with increased odds of cervical precancer, in HIV (Pereira et al., 2003), whereas positive psychological well-being is associated with better immune status and mortality among women with HIV (Ickovics, Milan, Boland, Schoenbaum, & Vlahov, 2006). Cognitive behavioral stress management (CBSM) interventions enhance quality of life among minority women with HIV (Lechner et al., 2003). The triple minority status (race/ethnicity, gender, socioeconomic position) of racial/ethnic minority women with HIV and adverse psychological impact of CIN and HPV infection (McCaffery et al., 2004) may negatively affect psychological well-being. Previously, CBSM reduced life stress and odds of cervical neoplasia in racial/ethnic minority women with HIV and HPV (Antoni et al., 2008). This secondary analysis tests the effects of CBSM on indicators of positive and negative well-being included in that study. We hypothesized that women undergoing CBSM would show greater decreases in negative well-being and greater improvements in positive well-being.

Methods

This secondary data analysis examined the effects of a 10-week CBSM group versus a 1-day psychoeducational seminar on negative and positive psychological well-being at three time points: pre-intervention (T_1), three months post-enrollment (T_2), and nine months post-enrollment (T_3). Participants were recruited between 2000 and 2004 from an obstetrics-gynecology clinic serving women with HIV. Inclusion and exclusion criteria were previously described (Antoni et al., 2008). Participants were women with HIV with a recent history of cervical neoplasia with or without HPV. Elevated distress was not required for inclusion. All women read and completed an Institutional Review Board-approved informed consent form. This study was conducted in compliance with the University Institutional Review Board.

Participants were randomized following completion of the T_1 assessment. Study staff were blind to experimental condition at each assessment. Cohorts of approximately nine participants were randomly assigned at a 2:1 (experimental: control) ratio, allowing for the randomization of approximately six participants to each group. A 2:1 randomization ratio was selected to enhance recruitment among individuals potentially reluctant to enroll with a 50% chance of receiving the intervention and to allow more individuals to receive the intervention.

The content and process of the delivering the 10-week CBSM group were adapted from those of previous studies with HIV+ men who have sex with men (Antoni, Ironson, & Schneiderman, 2007) to address the unique psychosocial, behavioral, ethnocultural, and medical issues faced by HIV+ minority women at risk for cervical cancer. Through accepted tailoring procedures described in detail elsewhere (Pereira, 2002), the intervention format fostered relaxed informal group sessions, relaxed start/stop times, and addressed attendance barriers (e.g. childcare, transportation, and lunch were provided). Group-based and group-chosen oral exercises honored the African American and Hispanic oral traditions and values of collectivism and familialism. Check-in periods began each session to resemble the process of “testifying” that often takes place in African American churches, and to identify salient stressors. The didactic portion was also modified to increase salience to racial/ethnic minority women with HIV. The “Serenity Prayer” was used to help differentiate when to use emotion-focused versus problem-focused coping strategies, with emphasis on combining spiritual coping with active coping. The assertiveness portion of the intervention was modified to address constraints on assertiveness related to cultural norms. This modified module de-emphasized the use of assertiveness as an interpersonal style in all situations and emphasized the use of interpersonal effectiveness and matching one’s interpersonal style to the context and dynamic of the situation at hand (e.g., aggressive behavior may be appropriate in some circumstances when assertiveness has failed to achieve the desired outcome and one’s personal safety is at risk). The modified relaxation portion emphasized strategies acceptable to participants, and discussed the use of meditation/prayer by racial ethnic minority female role models in times of adversity.

The content of the CBSM intervention was further tailored to increase its salience to women with HIV at risk for cervical cancer (Pereira, 2002). Education emphasized the importance of adherence to Pap smears, cervical dysplasia treatments, and HAART medication. The intervention also addressed the common psychosocial sequelae of having both HIV and HPV, problem-solved barriers to self-care, and provided information about safer sex behaviors. Groups met weekly for 135 minutes for 10 weeks. All facilitators were clinical psychology doctoral trainees, license-eligible post-doctoral fellows, or licensed psychologists who completed a 20-hr training program guided by a detailed training manual (Antoni & Pereira, 1999). All sessions were audiotaped for weekly clinical supervision by a licensed psychologist who provided feedback to facilitators to ensure fidelity to the protocol. Each session contained 45 minutes of relaxation training and 90 minutes of cognitive behavioral training (Antoni et al., 2008). Homework was assigned to enhance generalization of skills to real-world settings.

The one-day psychoeducational seminar consisted of a five-hour didactic intervention as described previously (Antoni et al., 2008). Facilitators of the seminar did not differ from the facilitators of the 10-week intervention and were also supervised by a licensed psychologist. The seminar consisted of education about relaxation and cognitive behavioral training. The seminar was designed more as training for self-help use of the techniques than for engendering group process. Homework was not assigned, and home-based practice of skills was not emphasized.

The Benefit Finding Scale (BFS; Antoni et al., 2001; Tomich & Helgeson, 2004) measured the extent to which participants perceived benefits from their HIV+ experience ($\alpha = .64$). The Total Positive Affect subscale of the Affects Balance Scale (ABS; Derogatis & Rutigliano, 1996) measured the frequency with which participants experienced positive affect ($\alpha = .94$). The Positive States of Mind Scale (PSOM; Horowitz, Adler, & Kegeles, 1988) measured participants’ ability to enjoy experiences associated with positive mood ($\alpha = .78$). The Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp-Ex; Brady, Peterman, Fitchett, & Cella, 1999) measured spiritual well-being (α

= .88). The Total Negative Affect subscale of the Affects Balance Scale (ABS; Derogatis & Rutigliano, 1996) measured the frequency with which participants experienced negative affect ($\alpha = .94$). A subset of items from the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) measured cognitive-affective depressive symptoms ($\alpha = .90$). The Measure of Current Status (MOCS; Carver, 2006) measured perceived improvement in relaxation skills ($\alpha = .73$).

The data were analyzed with intention to treat analyses and the last observation carried forward strategy for missing data. All participants who completed the T₁ assessment were retained in analyses, regardless of subsequent participation. Two multivariate repeated measures analyses of covariance (MANCOVA) were conducted. The first examined four domains of positive psychological well-being (positive affect, benefit-finding, positive states of mind, spiritual well-being) and the second examined two domains of negative psychological well-being (negative affect, cognitive-affective depressive symptoms) across time points (T₁, T₂, T₃). Intervention type was the between-subjects factor and post-hoc analyses were performed as appropriate. Correlations examined changes in perceived stress management skills and outcomes.

Results

A convenience sample of 142 participants was screened, of which 72 were eligible. Forty-six women were randomized to the 10-week CBSM intervention and 26 women were randomized to the 1-day psychoeducational seminar. There were no significant group differences on any baseline sociodemographic, behavioral, or health variables, as previously described (Antoni et al., 2008). There were no adverse events in either group. Six cohorts were assigned to the 10-week CBSM condition. Thirty-one participants allocated to the 10-week CBSM group attended at least one session, with a mean of 5.45 ($SD = 4.57$) sessions attended. Six 1-day psychoeducational seminars were scheduled with two to five participants invited per seminar. Eleven participants allocated to the 1-day psychoeducational condition attended the seminar, with a mean of 1.5 (range 0–3) attendees per seminar. Comparisons of completers vs non-completers are reported elsewhere (Antoni et al., 2008). Since completers of the T₃ psychosocial interview were significantly older ($M = 34.00$, $SD = 8.49$) than non-completers ($M = 28.72$, $SD = 7.53$), $F(1, 43) = 4.56$, $p = .04$, age was retained as a covariate.

The four positive well-being domains created a positive well-being construct ($r = 0.24$ to 0.54 , p 's $< .05$). MANCOVA showed that the 10-week CBSM group and the 1-day psychoeducational seminar groups significantly differed in changes in positive psychological well-being across time, ($F[6, 63] = 2.42$, $p < .05$, $\eta^2 = 0.19$, 90% Confidence Interval for $\eta^2 = 0.007$ to 0.260) (see Table 1). Post-hoc analyses revealed the 10-week CBSM intervention significantly increased positive affect from T₁ to T₃ ($p < .05$), positive states of mind from T₁ to T₃ ($p < .05$), and spiritual well-being from T₁ to T₂ ($p < .05$) and from T₁ to T₃ ($p = .01$). There were no significant changes in positive psychological well-being among women in the 1-day psychoeducational seminar across time.

Negative affect and depressive symptoms created a negative well-being construct ($r = 0.79$, $p < .001$). MANCOVA did not support the hypothesis that the 10-week CBSM group and the 1-day psychoeducational seminar groups significantly differed in changes in negative psychological well-being across time, ($F[2, 65] = 2.60$, $p = .08$, $\eta^2 = 0.07$, 90% Confidence Interval for $\eta^2 = 0.000$ to 0.174). Improvements in perceived relaxation skills were significantly associated with greater improvement in positive affect ($r = 0.29$, $p < .05$), positive state of mind ($r = 0.25$, $p < .05$), spiritual well-being ($r = 0.24$, $p < .05$), and negative affect ($r = -0.33$, $p < .01$).

Discussion

Previously a 10-week group-based CBSM intervention reduced life stress and odds of cervical pre-cancer in women with HIV (Antoni et al., 2008). This secondary analysis found that CBSM was associated with increased positive affect, positive states of mind, and spiritual well-being. The opportunity for social support in the CBSM group, and the fact that highly distressed individuals were not specifically recruited, may account for these findings. These findings are consistent with prior work (e.g., Antoni et al., 2001).

Contrary to hypothesis, CBSM did not affect negative psychological well-being. Given that a post-hoc power analysis revealed adequate power, this may be attributable to not specifically recruiting distressed individuals. Previously, CBSM was most likely to show effects on negative well-being in women who were most distressed at study entry (Antoni et al., 2001). It is possible that previously reported CBSM-associated reductions in life stress in women co-infected with HIV and HPV may not directly translate into reductions in negative psychological well-being unless the sample manifests elevated distress in response to life stressors. Evidence suggested that women who most increased their confidence in stress management skills showed the largest changes in positive and negative well-being. Perhaps these were the women who were most engaged and thus achieved the greatest intervention effects.

This study sought to specifically address the unique subset of racial/ethnic minority women with HIV who are at elevated risk for cervical cancer, and the intervention was tailored accordingly. Future research should examine CBSM and psychological well-being in racial/ethnic minority women with HIV, biopsy-confirmed CIN, and elevated distress. Given the small negative psychological well-being effect sizes, future research should explore the clinical meaningfulness of CBSM-associated changes in psychological well-being. The present study was limited by a small sample and high attrition rates, suggesting that greater effort is needed in recruitment and retention using community-based participatory research methods, which have yielded promising results in interventions for racial/ethnic minority individuals (Campbell et al., 1999). Finally, future research should employ a time-matched control condition to delineate the effects of intervention content versus attention. Despite these limitations, these findings provide a preliminary foundation from which future randomized controlled trials can proceed.

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Table 1

Positive Psychological Well-Being Across Time Points

Group	Means (SD)	t (df)	p	Hedges g(95% C.I.)
Benefit Finding	T ₁ 3.72 (.77)	1.90 (45)	.06	0.28 [-0.02, 0.57]
	T ₂ 3.72 (.77)	0.99 (45)	.33	0.15 [-0.14, 0.44]
	T ₃ 3.82 (.92)	0.58 (45)	.57	0.09 [-0.20, 0.37]
1-day Seminar	T ₁ 3.59 (.81)	0.31 (24)	.76	0.06 [-0.33, 0.45]
	T ₂ 3.59 (.81)	0.44 (24)	.66	0.09 [-0.31, 0.48]
	T ₃ 3.64 (.93)	-0.10 (24)	.92	-0.02 [-0.41, 0.37]
Positive Affect	T ₁ 69.74 (15.36)	2.60 (45)	.01	0.38 [0.08, 0.68]
	T ₂ 72.07 (15.49)	1.48 (45)	.15	0.22 [-0.08, 0.51]
	T ₃ 73.80 (13.51)	1.41 (45)	.17	0.21 [-0.09, 0.50]
1-day seminar	T ₁ 70.60 (16.03)	-1.13 (24)	.27	-0.23 [-0.62, 0.17]
	T ₂ 71.20 (16.16)	0.23 (24)	.82	0.05 [-0.35, 0.44]
	T ₃ 67.28 (13.94)	-1.70 (24)	.10	-0.34 [-0.74, 0.07]
Positive States of Mind	T ₁ 22.78 (3.88)	2.06 (45)	.04	0.30 [0.01, 0.60]
	T ₂ 23.59 (3.92)	1.73 (45)	.09	0.26 [-0.04, 0.55]
	T ₃ 23.85 (3.48)	0.68 (45)	.50	0.10 [-0.19, 0.39]
1-day seminar	T ₁ 22.80 (4.69)	1.20 (24)	.24	0.24 [-0.16, 0.64]
	T ₂ 22.80 (4.69)	0.05 (24)	.96	0.01 [-0.38, 0.40]
	T ₃ 23.84 (4.37)	1.65 (24)	.11	0.33 [-0.08, 0.73]
Spiritual Well-Being	T ₁ 19.01 (3.73)	2.83 (45)	.01	0.42 [0.11, 0.72]
	T ₂ 20.03 (2.86)	2.47 (45)	.02	0.36 [0.06, 0.66]
	T ₃ 18.74 (4.12)	-0.11 (45)	.92	-0.02 [-0.31, 0.27]
1-day seminar	T ₁ 18.74 (4.12)	-1.02 (24)	.32	-0.20 [-0.60, 0.19]
	T ₂ 18.40 (4.12)	-0.65 (24)	.52	-0.13 [-0.52, 0.27]
	T ₃ 18.26 (4.08)	-0.37 (24)	.72	-0.07 [-0.47, 0.32]

Note: 1-day Psychoeducational seminar $N = 25$, 10-week CBSM group $N = 46$. T₁ = Pre-intervention, T₂ = 3 months post-enrollment, T₃ = 9 months post-enrollment. Significance of overall model ($H[6, 63]$ = 2.42, $p < .05$, $\eta^2 = 0.19$, 90% Confidence Interval for $\eta^2 = 0.007$ to 0.260). Positive t values and Hedges g values indicate an improvement in functioning (increase in positive well-being).