Published in final edited form as:

AIDS Care. 2019 May ; 31(5): 529–535. doi:10.1080/09540121.2018.1546819.

Randomized Clinical Trial of a Community Navigation Intervention to Improve Well-being in Persons Living with HIV and Other Co-morbidities

Allison Webel¹, Maryjo Prince-Paul¹, Stephen Ganocy¹, Evelina DiFranco¹, Charles Wellman², Ann Avery³, Barbara Daly¹, and Jacquelyn Slomka⁴

¹Case Western Reserve University (CWRU) School of Nursing, Cleveland, OH;

²Hospice of the Western Reserve, Cleveland, OH;

³CWRU School of Medicine, Cleveland, OH and MetroHealth Medical Center, Cleveland, OH.

⁴Independent Scholar and Consultant, Cleveland, Ohio;

Abstract

Long-term survival of people living with HIV (PLWH) is associated with the development of co-morbid conditions and need for symptom management and other efforts to enhance quality of life. We conducted a longitudinal, randomized trial over 36 months to evaluate the effect of a community-based navigator intervention to provide early palliative care to 179 PLWH and other chronic conditions. Outcomes included quality of life, symptom management, coping ability, social support, self-management, and completion of advance directives. Data were analyzed using SAS mixed effects model repeat measurement. Our navigator program showed variable improvement over time of three outcome variables, self-blame, symptom distress, and HIV self-management. However, the program did not improve overall quality of life, social support, or completion of advance directives.

Keywords

HIV/AIDS; multimorbidity; palliative care; symptom management; community-based health care

INTRODUCTION

As PLWH age, the combination of age-related non-HIV-related comorbidities, adverse effects of drug therapy and the disease process itself complicate how to live well with chronic HIV as well as increase risk for mortality. (Fausto & Selwyn, 2011) In spite of good medical care, PLWH often experience unrelieved physical and psychological symptoms.

Corresponding Author: Allison R. Webel, 10900 Euclid Avenue, Cleveland Ohio 44106; Phone: 216-368-3939; arw72@case.edu.

Ethical Approval: All procedures performed in this study involving human participants were in accordance with the ethical standards of the Institutional Review Board of University Hospitals Cleveland Medical Center, Cleveland, Ohio, USA, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in this study.

Conflict of Interest: The authors declare that they have no conflict of interest.

(Harding et al., 2010; Karus et al., 2005; Simms, Higginson, & Harding, 2011) Poor symptom control may be due to unrecognized symptoms and ineffective physician-patient communication, (Karus et al., 2005) and fragmented care with multiple medical centers (Krentz, Worthington, & Gill, 2011) have been related to poor quality of life among PLWH. The occurrence of multimorbidity with HIV is associated with increased symptom burden and suggests that PLWH would benefit from effective symptom relief. Although a number of disease management models have been documented, there is increasing interest in home-based programs for chronic disease management. This interest has been prompted by technological advances, consumer interest and rising health care costs, as well as by the aging of populations and increased prevalence of chronic conditions. (Landers, 2010)

Geriatric palliative care, a model to meet the needs of older adults with multiple chronic comorbidities, (Holley, Gorawara-Bhat, Dale, Hemmerich, & Cox-Hayley, 2009) is similar to primary care in addressing comprehensive health needs and coordination of care. However, the focus of palliative care is on symptom management and planning for advancing illness through identification of patient values and goals. Palliative care programs for PLWH have been in place since the early epidemic when treatment options were limited. (O'Neill, Marconi, Surapruik, & Blum, 2000) With time, the distinction between curative care and palliative care may have been minimized by clinicians who cared for PLWH because of the need for symptom management throughout the course of the disease. (Selwyn & Forstein, 2003) However, specific barriers that prevent PLWH from receiving good palliative care have been noted including increasing specialists (e.g., cardiologists, oncologists) caring for PLWH who have limited experience caring for this population, ineffective patient-provider communication, a tendency to under-treat symptoms, HIV stigma, lack of a family or friend as caregiver, social isolation, low income levels and ethnic/cultural contexts. (Harding et al., 2005; Selwyn & Rivard, 2003)

Building on this literature, our study examined the impact of an early palliative care program in PLWH and other chronic conditions on important health outcomes including quality of life, symptom burden, coping ability, social isolation, HIV self-management, and advance care planning. Our specific aims were to 1) test the effect of an HIV Patient Navigation Program intervention on outcomes of quality of life, symptom burden, coping ability, social isolation, HIV self-management and advance care planning; and 2) determine whether effectiveness of the HIV Patient Navigation Program differs by age, gender, ethnicity, education, income level, level of palliative care service need, and length of time since HIV diagnosis. Our hypothesis was that at the end of the program, the intervention group would have improved quality of life, better symptom management reflected by less reported symptom distress, increased coping ability and HIV self-management, decreased social isolation, and higher completion rates of advanced care planning compared to the control group.

METHODS

DESIGN:

We conducted a 2-arm randomized clinical trial of a navigator program intervention to provide adjunct early palliative services—that is, palliative care services early in the chronic

disease trajectory-- versus standard treatment to PLWH and other chronic conditions, in the community. In partnership with the academic-based investigators, the navigator program of clinical services was provided to the intervention participants by a well-established, large, regional hospice/palliative care organization based on a current navigator program and tailored to HIV patients using our focus group data. This study was approved by the study site's Institutional Review Board and written consent was obtained from all participants.

SETTING/POPULATION:

Intervention procedures occurred in the participant's home and/or clinic or other community sites according to participant preferences and availability. PLWH were eligible if they were 18 years old, English-speaking, had at least 1 chronic condition in addition to HIV, were not currently enrolled in a palliative care program, lived within 30 miles of the study offices, and received HIV primary care at one of 3 study recruitment sites. A chronic condition was defined as any physical ailment that required medical management over time. PLWH solely with mental health diagnoses and/or substance abuse in the absence of other comorbidities were excluded. The chronic conditions most frequently-reported by participants were mental illness, hypertension, substance abuse and pulmonary problems.

RECRUITMENT:

Participants were recruited from 3 urban clinical sites specializing in the care of HIV patients: a large, university medical center; a large county-funded medical center, and a federally-qualified health center. We recruited by letter using a clinical database and a research database, maintained by co-investigators (BR and AW, respectively), of PLWH who had given prior consent to be contacted. Participants were also recruited by posted notices at clinical sites, clinician referral, and word-of-mouth. A total of 264 individuals were screened for eligibility; 179 participants were enrolled. Primary reasons for non-participation included lack of a qualifying co-morbid condition and not receiving primary care at one of the study sites (Figure 1).

RANDOMIZATION:

Participants were randomized using a computerized minimization procedure with a 1:1 ratio to ensure equal representation of gender, race, age, and level of need and to minimize variability within groups. (Lin, Zhu, & Su, 2015) Study personnel estimated level of need using indicators of 1) number of comorbid conditions, 2) unstable housing situation or homelessness; 3) absence of an identified significant other; 4) living alone; and 5) number of hospitalizations or emergency room visits in the previous 6 months. An indicator "score" of 9+ defined a likely high need for services, a score of 4 – 8 defined moderate need, and a score of 3 or fewer suggested low need. Level of need was confirmed and re-assessed at each visit by the navigator team for purposes of clinical follow-up. Blinding of study staff was not possible due to the nature of the intervention and need to consent to clinical services.

PROCEDURES:

The intervention was a program of early palliative care services delivered over 36 months by a navigator team consisting of an Advanced Practice Nurse, a Social Worker and trained

volunteers. Procedures consisted of baseline and periodic assessment of physical, medical, social, and psychological needs, volunteer support, advance care planning, care coordination, and assistance with transitions among clinical levels of care. Participants received care as needed, but minimum visits and/or telephone follow-up by navigator personnel were specified per protocol and differed based on the participant's level of need as assessed by the navigator team. For example, Level 1 patients (most acute) received nurse or social work visits monthly for 6 months, then every other month and as needed; Level 2 (moderately acute)- patients received visits every other month for six months and as needed; Level 3 (least acute) received visits every 3 months.

Using The National Consensus Project Clinical Practice Guidelines for Quality Palliative Care, we developed a comprehensive assessment which served as the basis for the development of an individualized plan of care for each participant randomized to the navigator intervention. This included, but was not limited to, mitigation of physical symptoms, medication management, mental health, and assistance with activities of daily living. Intervention participants received assessment phone calls from the nurse or social worker in months without an in-person visit. Control subjects received follow-up, also specified by protocol, at baseline, in the first week after enrollment, and then every other month. To control for attention, control subjects were asked about general well-being, medication adherence, and emergency department, clinic use or hospitalizations. Control subjects who raised health issues or asked for specific information were referred to their primary care provider. Outcome data from both study arms were collected at baseline and at 9-month time points between June 2013 and August 2016.

INSTRUMENTS/MEASURES:

The independent variable was an HIV Navigation Program intervention. Based on existing literature, outcome variables included quality of life, symptom burden, coping ability, social isolation, ability to self-manage one's health, and documentation of advance directives.

Quality of life was assessed with the 35-item *HIV/AIDS-Targeted Quality of Life* scale which measures 9 domains of quality of life. A total sub-scale score is computed by adding up all item responses in each domain and converting the sum to a 0–100 scale based on an existing algorithm. Higher scores will indicate better function. In the present study, we found a Cronbach's α ranging from 0.77 (medication worries subscale) to 0.92 (sexual function subscale).

Illness coping ability was assessed with the Brief COPE (Carver, 1997), which measures 14 different coping constructs on a scale of 1–4 where 1 = I haven't been doing this at all, 2 = I've been doing this a little bit, 3 = I've been doing this a medium amount, and 4 = I've been doing this a lot. Internal consistency reliability alphas range from 0.50 to 0.90 for the 14 factors (Carver, 1997).

HIV self-management was assessed with the 20-item *HIV Self-Management Scale* which examines 3 HIV self-management domains including: 1) Daily self-management health practices; 2) Social support and HIV self-management; and 3) Chronic nature of HIV self-management. Each domain is separately scored by summing items and dividing by the

number of items in that domain. In this study, the Cronbach's α reliability coefficients ranged from 0.65 (chronic nature of HIV)—0.87 (social support and HIV).

Symptom burden was assessed with the 10-item *Edmonton Symptom Assessment System* (ESAS). The scale measures symptom intensity and distress and symptom count of up to 15 symptoms. Each symptom is score on a 0–11 visual analog scale and are summed to create a total symptom distress score. Higher sores indicate more symptom burden. The physical distress subscore is the sum of the six symptoms (pain, nausea, tiredness, drowsiness, lack of appetite, and shortness of breath), and the psychological distress subscore is the sum of the scores of depression, anxiety, and feeling of low well-being). In this study, the Cronbach's alpha reliability coefficient was 0.84.

Social isolation was assessed with the 6-item *Hawthorne Friendship Scale* which measures perceived social isolation and perceived emotional loneliness in the past four weeks. (Hawthorne, 2008) Each of the 6 items is scored on a 0–4 scale with a total scale range of 0 to 24. Higher scores indicate greater social connectedness and lower scores indicate more social isolation. The *Hawthorne Friendship Scale* has good psychometric properties and a Cronbach's α reliability coefficient of 0.83 in this study.

Execution of advance directives and change from baseline percent were measured. Covariates included age, gender, race/ethnicity, education, income level, and self-reported number of years since HIV diagnosis.

STATISTICAL METHODS:

Descriptive statistics were used to describe demographic and clinical variables. This included means and standard deviations for continuous variables and frequencies and percentages for categorical variables.

Mixed effects model repeat measurement (MMRM) models were used to compare the effect of the two groups, intervention and no intervention, on the outcome variables measured at baseline, 9, 18 and 27 months. Each of the models included group, study month and group by study month interaction. The models were also adjusted for six covariates of interest, age, race, gender, education, income and time (in years) since HIV diagnosis. MMRM enabled inclusion of all subjects who had at least one assessment post baseline (ITT) in the regression models.

Statistical significance was based on a Type I error rate of 0.05 for all statistical tests (two-tailed). Since this was an exploratory study, no adjustment was made for multiple comparisons. SAS version 9.4 and R statistical programs were used for statistical analysis.

RESULTS

On average, participants were 50 years of age, male (59%) and African-American (70%). At baseline, 31 (13%) of participants had a Living Will and 37 (21%) had a Durable Power of Attorney. The only significant differences at baseline were that more participants in the control group had a Durable Power of Attorney ($p=0.02$) (Table I). Of the 179 participants, 150 (71=Intervention [I]; 79=Control [C]) completed follow-up to 9 months; 122 (51=I;

71=C) were followed to 18 months; 99 (43=I; 56=C) to 27 months, and 25 (10=I;15=C) to 36 months. As only 25 participants completed the 36-month follow-up we decided to focus analysis on the data to the 27-month follow-up.

Overall, all participants in the intervention group received their designated dose of the intervention based on their baseline assessment. However, participants also had changes in their acuity levels over time. Overall, 3% ($n=3$) had an increase in acuity from baseline to 9 months, and 17% ($n=15$) had a decline in acuity. For those who increased in acuity, most received some additional navigator services including increased phone calls and visits by the social worker and/or the advanced care practice nurse.

Results for the mixed effects model repeat measurement are shown in Table II. The intervention had a significant effect over time on 3 outcome variables. “Self-blame” (as a domain of coping, measuring a tendency to blame or criticize oneself) was lower in the control group ($p=0.02$), though results converged around the 18th month time point, then diverged again. Reported symptom distress in the intervention group, decreased at nine months ($p=0.003$) then increased, though not above baseline. Understanding of the “chronic nature of HIV self-management”, showed a positive effect at the 9-month time point ($p=0.01$), but for the remaining months, the intervention showed a negative effect.

There was no significant effect of the intervention on executing advance directives (i.e., a living will and/or durable power of attorney for health care) over time (living will ($X^2(1)=1.3817$, $p=0.2398$) and durable power of attorney for healthcare ($X^2(1)=0.5485$, $p=0.4589$). Similarly, there was no statistically significant difference between intervention and control in number of ER visits over time (estimate= -0.060205 , $SE=0.157448$, $p=0.7022$).

DISCUSSION

We conducted a randomized clinical trial to test a program of early palliative care services to PLWH with other chronic conditions. Though our analysis suggests some variable benefits in reduction of symptom distress and in aspects of coping and self-management behaviors, it did not show overall benefit in regard to outcomes of better symptom management, quality of life, ability to cope, decreased social isolation, increased ability to self-manage illness, or increase in completion of advance care planning.

Our study program was similar in many respects to others providing adjunct primary care at the community level. However, ours was unique in targeting a population of PLWH who were at higher risk due to the presence of comorbid conditions, and in providing a clinical intervention focused on palliative care early in the disease trajectory. Of 15 models of comprehensive care for older adults described in a 2009 report, (Boult et al., 2009) palliative care was not one of the models. Our study, then, presents the testing of this newer type of model.

Our results were similar to those of Boult and colleagues (Boult et al., 2009) in that all the models showed relatively few positive benefits. But as these authors note, adoption of any model is dependent on numerous factors other than positive outcome measures. Such

extrinsic factors include availability of an expert workforce, teamwork among primary care clinicians and specialists, adherence to evidence-based guidelines, lack of financial barriers, and congruence with the prevailing health care culture. (Boult et al., 2009) Future clinical programs adopting a similar early palliative care model should carefully consider and tailor the programs to these extrinsic factors.

In our early palliative care model, several factors favored the potential for positive results, in particular, a dedicated and committed workforce and a community agency skilled in evidence-based palliative care. While we expected the relatively long-term follow-up to be beneficial, attrition, some of which might have been due to ‘research fatigue’ from long-term participation, was problematic.

Other factors working against positive outcomes may have been the characteristics of the HIV population, which is diverse in ethnicity and income level and challenging to follow due to transient living arrangements and mental health and substance abuse issues. On the other hand, our population was fairly well-educated—significant differences in educational level were associated with ability to self-manage one’s illness. Our participants reported strong relationships with their health professionals, and continuity with their primary HIV clinicians was important.

Strengths of our study included a high proportion of women and African-American participants and the use of a standardized intervention in a real world context. Yet despite these strengths, our study had a number of noteworthy limitations. Over the 36-month intervention, changes occurred with some study personnel and clinicians, possibly disrupting continuity valued by participants. Such changes are inevitable and reflect real life in health care and in pragmatic trials. Another possible limitation was due to study design. The analysis plan did not account for the high number of variables and scale items, and therefore results should be interpreted with caution. The large number of variables relative to sample size may have produced some significant-appearing relationships that were actually due to chance. Another possible limitation was our choice of measures. The discipline of palliative care is in the process of learning what outcomes are important and how to measure them to reflect the success of an intervention. Further sub-analyses of data from our instruments may add to this knowledge base. Finally, in consideration of participant burden we did not collect data on other important clinical outcomes including HIV medication adherence, engagement with HIV care, or laboratory markers of HIV disease (HIV Viral Load or CD4 T cells). This limited our ability to examine the impact on other important, but not primary, outcomes.

CONCLUSIONS

The testing of programs to provide comprehensive early palliative care to HIV populations is essential to the health and well-being of these populations. Although our study had few statistically significant results, it did produce potentially clinically important results by improving our knowledge of how to care for these populations. Further sub-analyses of our data may provide additional information to improve research methodologies and ultimately to enhance the care of PLWH with other chronic conditions.

Acknowledgments:

We wish to thank our participants, caregivers and staff at the Special Immunology Unit at University Hospitals Cleveland Medical Center; MetroHealth Hospital, Cleveland, OH; Care Alliance, Cleveland OH; the Center for AIDS Research, Cleveland, OH and our community partner, Hospice of the Western Reserve, Cleveland, OH. We are grateful also to Benigno Rodriguez, MD, Carrie Rodd, MA, Patricia Brandt, BS, Usha Vyas, BS, Jackson Currie, and Nahida Gordon, PhD for their valuable project assistance. Special thanks are due our clinical Navigators, Thomas Quinn, APRN, Michele Specht, LSW, Jennifer Martnick, APRN, Michelle Dean and Christina Guarnieri. This study was funded by the National Institutes of Health (NIH), National Institute of Nursing Research (NINR), Grant #NR014059, Jacquelyn Slomka, PhD, RN, Principal Investigator. The data instruments/measures used for this study were managed using REDCap Grant Number UL1TR000114 from the National Center for Advancing Translational Sciences (NCATS) of the NIH. The authors of this article are solely responsible for its content. Views presented do not necessarily represent official views of the NIH/NINR/NCATS.

Funding: This study was funded by the National Institutes of Health (NIH), National Institute of Nursing Research (NINR), Grant #NR014059, Jacquelyn Slomka, PhD, RN, Principal Investigator.

This study was registered in www.clinicaltrials.gov, #NCT01884389.

REFERENCES

- Boult C, Green AF, Boult LB, Pacala JT, Snyder C, & Leff B (2009). Successful models of comprehensive care for older adults with chronic conditions: evidence for the Institute of Medicine's "retooling for an aging America" report. *J Am Geriatr Soc*, 57(12), 2328–2337. doi: 10.1111/j.1532-5415.2009.02571.x [PubMed: 20121991]
- Carver CS (1997). You want to measure coping but your protocol's too long: consider the brief COPE. *Int J Behav Med*, 4(1), 92–100. doi:10.1207/s15327558ijbm0401_6 [doi] [PubMed: 16250744]
- Fausto JA, Jr., & Selwyn PA (2011). Palliative care in the management of advanced HIV/AIDS. *Prim Care*, 38(2), 311–326, ix. doi:10.1016/j.pop.2011.03.010 [PubMed: 21628041]
- Harding R, Karus D, Easterbrook P, Raveis VH, Higginson IJ, & Marconi K (2005). Does palliative care improve outcomes for patients with HIV/AIDS? A systematic review of the evidence. *Sex Transm Infect*, 81(1), 5–14. doi:10.1136/sti.2004.010132 [PubMed: 15681714]
- Harding R, Lampe FC, Norwood S, Date HL, Clucas C, Fisher M, ... Sherr L (2010). Symptoms are highly prevalent among HIV outpatients and associated with poor adherence and unprotected sexual intercourse. *Sex Transm Infect*, 86(7), 520–524. doi:10.1136/sti.2009.038505 [PubMed: 20551235]
- Holley AP, Gorawara-Bhat R, Dale W, Hemmerich J, & Cox-Hayley D (2009). Palliative Access Through Care at Home: experiences with an urban, geriatric home palliative care program. *J Am Geriatr Soc*, 57(10), 1925–1931. doi:10.1111/j.1532-5415.2009.02452.x [PubMed: 19702614]
- Karus D, Raveis VH, Alexander C, Hanna B, Selwyn P, Marconi K, & Higginson I (2005). Patient reports of symptoms and their treatment at three palliative care projects servicing individuals with HIV/AIDS. *J Pain Symptom Manage*, 30(5), 408–417. doi:10.1016/j.jpainsymman.2005.04.011 [PubMed: 16310615]
- Krentz HB, Worthington H, & Gill MJ (2011). Adverse health effects for individuals who move between HIV care centers. *J Acquir Immune Defic Syndr*, 57(1), 51–54. doi:10.1097/QAI.0b013e318214fee [PubMed: 21346587]
- Landers SH (2010). Why health care is going home. *N Engl J Med*, 363(18), 1690–1691. doi:10.1056/NEJMp1000401 [PubMed: 20961239]
- Lin Y, Zhu M, & Su Z (2015). The pursuit of balance: An overview of covariate-adaptive randomization techniques in clinical trials. *Contemp Clin Trials*, 45(Pt A), 21–25. doi:10.1016/j.cct.2015.07.011 [PubMed: 26244705]
- O'Neill JF, Marconi K, Surapruik A, & Blum N (2000). Improving HIV/AIDS services through palliative care: an HRSA perspective. *Health Resources and Services Administration. J Urban Health*, 77(2), 244–254. [PubMed: 10856005]
- Selwyn PA, & Forstein M (2003). Overcoming the false dichotomy of curative vs palliative care for late-stage HIV/AIDS: "let me live the way I want to live, until I can't". *Jama*, 290(6), 806–814. doi:10.1001/jama.290.6.806 [PubMed: 12915434]

- Selwyn PA, & Rivard M (2003). Palliative care for AIDS: challenges and opportunities in the era of highly active anti-retroviral therapy. *J Palliat Med*, 6(3), 475–487. doi: 10.1089/109662103322144853 [PubMed: 14509497]
- Simms VM, Higginson IJ, & Harding R (2011). What palliative care-related problems do patients experience at HIV diagnosis? A systematic review of the evidence. *J Pain Symptom Manage*, 42(5), 734–753. doi:10.1016/j.jpainsymman.2011.02.014 [PubMed: 21620647]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Figure 1.
Study Participation Diagram

Table I:

Baseline Characteristics of the Participants by Group

	Intervention (<i>n</i> =90)	Control (<i>n</i> =89)	Difference (<i>p</i> value) ¹
Demographics Characteristics			
Age in years (±SD)	50 (8.5)	49 (9.8)	0.50
Gender			0.92 ²
Male (%)	52 (58)	54 (61)	
Transgender (%)	2 (2)	2 (2)	
Race (%)			0.96 ²
African American/Black (%)	63 (70)	62 (70)	
Caucasian/White/Other (%)	27 (30)	27 (30)	
Marital Status (%)			0.29 ²
Married or Domestic Partnership (%)	7 (8)	11 (12)	
Single/Separated/Divorced (%)	83 (92)	78 (88)	
Education (%)			0.59 ²
High school, GED or less (%)	47 (52)	48 (54)	
Some college or technical school training (%)	29 (32)	33 (37)	
College (BS or BA) or higher (%)	14 (16)	8 (9)	
Monthly Income (%)			0.91 ²
Less than \$600	23 (26)	20 (23)	
\$600-\$799	39 (43)	39 (44)	
\$800-or more	28 (31)	30 (34)	
Have Health Insurance (%)	90 (100)	89 (100)	1.0 ²
Have Permanent Housing (%)	73 (81)	72 (81)	0.45 ²
Has a Living Will	13 (14)	18 (20)	0.47 ²
Has a Durable Power of Attorney for Health Care	13 (14)	24 (27)	0.02 ²
Mean CD4+T Cell count (±SD) / µL	597 (377)	616 (361)	0.77
Number of participants with an HIV Viral Load <50 copies ³	42 (72)	60 (77)	0.45 ²

¹: Differences between groups analyzed using t-test unless otherwise noted;²: Differences between groups analyzed using Pearson Chi Square test;³: Seventy-seven participants in the control group and 59 participants in the intervention had a medical record available for chart abstraction of HIV Characteristics

Table II.

Test for significant design effects, Group, Time and Group x Time interaction, in mixed effects models of Instruments adjusted for select covariates Age, Sex, Race, Education, Income and HIV Duration. Significant results highlighted.

	Effect <i>p</i> -values		
		Group x	
	Group	Time	Time
Brief COPE			
1. Self-distraction	0.03	0.51	0.52
2. Active coping	0.92	0.97	0.69
3. Denial	0.33	0.46	0.08
4. Substance use	0.14	0.88	0.38
5. Use of emotional support	0.48	0.39	0.42
6. Use of instrument support	0.71	0.21	0.44
7. Behavioral disengagement	0.18	0.01	0.94
8. Venting	0.11	0.73	0.30
9. Positive reframing	0.56	0.25	0.80
10. Planning	0.94	0.66	0.99
11. Humor	0.37	0.30	0.30
12. Acceptance	0.59	0.38	0.82
13. Religion	0.53	0.86	0.17
14. Self-blame	0.07	0.28	0.02
Symptom Assessment			
1. Distress	0.78	<.01	.003
Friendship Scale			
1. Friendship	0.92	0.02	0.34
HAT QoL			
1. Overall function	0.69	0.05	0.17
2. Life satisfaction	0.59	0.01	0.91
3. Health worries	0.86	<.01	0.68
4. Financial worries	0.61	<.01	0.27
5. Medication worries	0.93	0.02	0.66
6. HIV mastery	0.05	0.11	0.16
7. Disclosure worries	0.79	0.38	0.53

	Effect <i>p</i> -values		
	Group x		
	Group	Time	Time
8. Provider trust	0.51	0.47	0.37
9. Sexual function	0.15	0.25	0.50
HSM Scale for Women			
1. Daily self-management	0.99	0.45	0.91
2. Support and self-management	0.94	0.11	0.68
3. Chronic nature of HIV self-management	0.14	0.20	0.01