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Facing HIV as a Family: Predicting Depressive Symptoms with Correlated Responses

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Abstract

This study makes an effort to go beyond traditional analytical models to explore the complex and interactive nature of family processes. A total of 79 families affected by HIV in China participated in the study (79 persons living with HIV [PLH] and 79 seronegative family members), with in-person interviews conducted in 2009. A higher level of depressive symptoms was reported by PLH participants than their family members. Negative associations between depressive symptoms and 1) social support and 2) family relations were observed for both PLH and their family members. Results from Actor-Partner Interdependence models indicate that the depressive symptoms of PLH and their family members were positively correlated when either the *family relations measure* or the *social support measure* was included in the model. Results highlight the link between family experience and individual well-being, with implications for designing and implementing interventions for families impacted by HIV.

Keywords

AIDS; HIV; family; depression; actor-partner; China

People living with HIV (PLH) face many challenges. Complicated therapeutic regimens with unpleasant side effects, recurrent symptoms, fear of disclosure, loss of employment, stigma and discrimination, impoverishment, and premature death are just a few of the issues that PLH may need to confront (Antle, Wells, Goldie, DeMatteo, & King, 2001; Herek & Capitanio, 1993; Lee & Rotheram-Borus, 2001; Li et al., 2009; Nöstlinger et al., 2004). In view of these multiple challenges, it is not surprising that there are elevated levels of psychological distress and mental health problems among people with HIV infection (Catalan, 1998; Ciesla & Roberts, 2001; Heckman et al., 2004; Orlando et al., 2002).

HIV is a disease that places stress on the entire family (Bor, Miller, & Goldman, 1993; Rotheram-Borus & Lightfoot, 2000). Psychological distress, such as symptoms of depression and anxiety, has been found to impact all members of a family coping with a

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relative with chronic disease (Downey & Coyne, 1990; Woods, Haberman, & Packard, 1993). Many previous studies conducted among caregivers, children, and HIV-negative partners provide supportive evidence (Armistead, Klein, & Forehand, 1995; Lee, Detels, Rotheram-Borus, Duan, & Lord, 2007; Moore, Vosvick, & Amey, 2006; Murphy, Marelich, Hoffman, & Schuster, 2006; Rotheram-Borus, Robin, Reid, & Draimin, 1998; Wight, 2000). A recent study found that an HIV-infected person's stress process could affect family members' level of depression (Feaster & Szapocznik, 2002).

A number of factors have been identified that contribute to the high prevalence of depressive symptoms and anxiety, including stigma, loss of social support, and poor family relations (Perkins, Stein, Golden, Murphy, Naftolowitz, & Evans, 1994; Prachakul, Grant, Keltner, Trisvan, Lopez, Torgersen, et al., 2007). Social support is an important protective factor of psychological stress, encompassing structural aspects (the presence of social ties, the frequency of social contacts) and supportive functions (e.g., tangible assistance, provision of information, and expression of caring and emotional connectedness) (Cohen Mermelstein, Karmarck, & Hoberman, 1985; Serovich, Kimberley, Mosack, & Lewis, 2001). There is a well-documented inverse relationship between social support and poor mental health among PLH as well as their family caregivers (Fleishman et al., 2000; Li, Thammawijaya, Jiraphongsa, & Rotheram-Borus, 2009; Mizuno, Purcell, Dawson-Rose, Parsons, & the SUDIS Team, 2003; Simoni, Montoya, Huang, & Goodry, 2005; Vyavaharkar et al., 2009). Furthermore, family relations appear to have an important role in the psychological status of the individual (Catalan, Klimes, & Day, 1992; Perkins et al., 1994; Semple et al., 1997). A study of mothers living with HIV/AIDS found that depression was associated with poorer cohesion within the family (Murphy, Marelich, Dello Stritto, Swendeman, & Witkin, 2002) and another study observed that the HIV patient-caregiver relationship was associated with caregiver depression as well as depression among HIV patients (Miller, Bishop, Herman, & Stein, 2007).

Identifying the factors associated with emotional distress and mental health problems in PLH and their family members is an important step towards developing interventions to improve mental health. In spite on this, previous studies often have focused on risk and protective factors associated with mental health at the individual level, with little attention paid to the associations between PLH and their family members in predicting mental health. In this study, we examine how social support and family relations predict depressive symptoms for PLH and family members not only at the individual level, but also at the family level with correlated measures.

Methods

Study Background

This study uses data from a pilot study of the Together for Empowerment Activities (TEA) intervention, a family intervention for HIV-affected families. Data were collected in 2009 from two counties in Anhui province, China, a region where most existing HIV infections (over two-thirds) were caused by paid plasma donations (Wu, Liu, & Detels, 1995; Wu, Rou, & Detels, 2001). Because the spread of HIV through plasma donation primarily occurred in the early 1990s, many HIV-infected individuals are married and have children currently (Ji, Detels, Wu, & Yin, 2006).

Approvals for this study were obtained from the Institutional Review Board of the University of California at Los Angeles, the Medical Institution Review Board of Anhui Province Center for Disease Prevention and Control, and the Medical Institution Review Board of Anhui Medical University.

Procedures

Research team members served as recruitment staff and assessment interviewers and received training before the start of the study. With assistance from village health workers, project recruiters approached potential participants by following standardized scripts to ensure all ethical issues were covered and consent was secured. The following inclusion criteria were used for initial screenings: 1) confirmation of an AIDS diagnosis or HIV-positive status, 2) having a seronegative family member at home, and 3) the family member was willing to participate in the study. All family members were contacted after obtaining permission from the PLH participants.

After receiving a complete description of the study, all PLH and their family members who agreed to participate signed an IRB-approved consent form. The refusal rate was approximately 4%. Following informed consent, in-person interviews were conducted either at a family's home or another preferred venue such as a village clinic. PLH and family members were interviewed separately. Each interview took about 45 to 60 minutes. All participants were paid 50 yuan (equivalent to \$8 U.S.) for each assessment.

During the interview, PLH and family members were asked questions about demographics, perceived family relations, social support, and depressive symptoms. Seventy-nine families, including 79 PLH and 79 family members (a total of 158 participants), were included in the current study.

Measures

The following measures were used for both PLH participants and their family members.

Depressive symptoms were measured using the short version of the Zung Self-Rating Depression Scale (Zung, 1965). This is a 10-item instrument adapted from the original 20-item questionnaire. The participants were asked how often they feel each of 10 situations, including "I feel down-hearted and blue," "I get tired for no reason," and "I have trouble sleeping at night." Response categories were from (1) "a little of the time" to (4) "most of the time." The overall scale score was the sum of the individual items. A higher score of the scale indicates a higher level of depressive symptoms. Cronbach alpha values for PLH participants and for family members were 0.76 and 0.83, respectively.

Social support was measured using the 19-item Medical Outcome Study (MOS) Social Support Survey (Sherbourne & Stewart, 1991). The survey was used to gauge the perceived availability of different types of support. The MOS covers four domains: 1) eight items for emotional/informational support, 2) four items for tangible support, 3) three items for affectionate support, and 4) three items for positive social interaction. For each individual item, participants were asked how often the type of support in each statement was available to them (the five-score response ranged from "none of the time" to "all of the time"). The scale of social support was the summed score from all four domains, with a higher score indicating a better level of social support. The inter-item reliability of the scale was high for both PLH (Cronbach's alpha = 0.90) and family members (Cronbach's alpha = 0.93).

Family relations was measured by an adapted version of the Family Functioning scale (Bloom, 1985; Bloom & Naar, 1994). The original scale is a 75-item survey consisting of 15 scales reflecting family relationship, system maintenance, and personal growth dimensions. For this study, two subscales—family cohesion and family conflict—were chosen based on study interests and cultural appropriateness. Each of the subscales consisted of 5 items, and a total of 10 statements were used:

1. Family members really help and support one another.

2. There is a feeling of togetherness in our family.
3. Our family doesn't do things together.
4. We really get along well with each other.
5. Family members seem to avoid contact with each other when at home.
6. We fight a lot in our family.
7. Family members sometimes get so angry they throw things.
8. Family members hardly ever lose their tempers.
9. Family members sometimes hit each other.
10. Family members always criticize each other.

For each item, participants were asked how true each statement was for their own family on a four-point Likert scale ranging from "very untrue" to "very true." The scale of family relations was the sum of all 10 items. Some items were reverse-coded so that the higher score would indicate better family relations. Cronbach's alpha values for this scale were 0.76 for PLH and 0.82 for family members.

Participant demographic information such as age, gender, education level, marital status, and income was collected and used in this study. Age was computed by subtracting the reported year of birth from the assessment year. Annual individual income instead of family income was used in this study.

Participants

The study sample consisted of 79 families, 79 PLH participants, and their seronegative family members (Table 1). Over half of the PLH were male (63.3%) and the majority of family members were female (65.8%). A similar mean age for PLH and family members was recorded (about 41 years old), and approximately 90% of the PLH and their family members were married or living as married. Although both groups were associated with low education, the percentage of no formal schooling reported by family member participants (27.9%) was double that of PLH (13.9%). The main occupation for PLH and their family members was farming, with 74.7% working at least as part-time farmers. In light of an annual individual income, about 48% of PLH and 44% of family members reported having an individual income of 2000 Yuan (US\$ 310) or less per year.

Statistical Analysis

Descriptive statistics (mean and SD) and frequencies for PLH and family members at baseline were summarized for continuous and categorical variables, respectively. We estimated the Pearson's correlations (r) for the following: 1) between PLH measures for depressive symptoms, social support, and family relations; 2) between the family member's measures; and 3) for each of these three measures between PLH and family member samples. Also, each of the three indicators was measured within a family, thus a paired t-test was used to evaluate whether the difference in levels of each measure between PLH and family members was significant from zero.

This study examined the relationships between depressive symptoms reported by PLH and family members within a family through the use of traditional univariate regression and actor-partner interdependence models (APIMs). The univariate regression model treated the depressive symptoms reported by PLH and family members as a separate outcome while the APIM treated the depressive symptoms reported by PLH and family members as a correlated outcome. In recent years the APIM has been increasingly used in social science

studies, including studies of communication and social support by parents of children with cancer (Hall, 2010), family stress, and parental responses to children's negative emotion (Nelson et al., 2009). The APIM is a model of dyadic relationships that integrates a conceptual view of interdependence with the appropriate statistical techniques for measuring it (Campbell & Kashy, 2002; Cook & Kenny, 2005). In this study, one consequence of interdependence is that the behaviors of PLH could impact the outcomes of their family member. The APIM allows us to investigate how a PLH's social support or family relations influence his or her own depressive symptoms, or his or her family member's depressive symptoms, and vice versa. By treating both as outcomes, this approach examines the associations of paired outcome measures and other measures, which cannot be conducted with a univariate regression model.

Specifically, in this study we used the univariate multiple regression mode first to assess the relationship between an individual's depressive symptoms (outcome) and each of the two following measures (predictors): his or her own social support or family relations, controlling for participants' age and gender. In these analyses, we included the same predictors for both PLH and family members; however, the regression models do allow the predictors to be different for PLH and family members.

To take into account the correlated depressive symptoms reported by a PLH and family members, we analyzed the paired depressive symptoms using the APIM (Campbell & Kashy, 2002). We used the two-intercept approach introduced by Raudenbush and colleagues (1995), which allowed the intercept to be different for the PLH and family member. The predictors included in the models were individual age, gender, member (PLH vs. family member), his or her own social support or family relations (actor effects), and his or her family member's social support or family relations (partner effects). The quantitative predictors, such as social support and family relations, were centered around their means. Next, we added two interaction terms to the models to learn about the degree to which there were differences in the sizes of actor effects and partner effects across PLH and family member. The levels of depressive symptoms reported by a PLH and by his or her family member are correlated through a shared covariance structure that incorporates correlations between paired outcomes. The variances of residuals for PLH and family members were allowed to be different in our models (i.e., we used a compound symmetry approach with heterogeneous variances). All analyses were conducted using SAS 9.2 software (Cary, NC, SAS Institute).

Results

The means and standard deviations of the levels of depressive symptoms, social support, and family relations for PLH and family members are shown in Table 1. A higher level of depressive symptoms was reported by PLH than by family members (20.9 vs. 17.1; $p < 0.0001$). Similar ranges were reported from PLH (9–32) and family members (9–31). We found the level of social support reported by PLH was slightly higher than that by family members (59.2 vs. 55.4, respectively), but the difference was not significant. However, similar levels of family relations were reported by PLH and by family members.

We observed a positive correlation for depressive symptoms reported by PLH and by family members, a weak correlation for social support reported by PLH and by family members, and a significantly positive correlation for family relations reported by PLH and by family members ($p = 0.001$, Table 2). Depressive symptoms and social support were negatively correlated for both PLH and for family members; a stronger correlation for family members was indicated ($p < .0001$). Family relations reported by PLH was significantly associated with their reported depressive symptoms, whereas a stronger association was observed for family

members ($p<.0001$). Although perceived social support and family relations were not significantly related for PLH, the association for family members was significant.

Results from traditional univariate analyses are summarized in Table 3. The results from the univariate regression model for PLH only, adjusted for age and gender, were similar to those from the analyses in Table 2. Significant age and gender effects in the univariate regression model with social support were observed only for the family member participants ($p=0.0025$ vs. 0.0187 , respectively).

Table 4 presents the estimates for actor and partner effects and the effects of age, gender, and member. The left column of the table represents the model with social support and the right column of the table represents the model with family relations. For the model with social support, significant age and gender effects, and a significantly higher level of depressive symptoms reported by PLH than family members, were observed. The actor effect measures the degree to which a person's level of depressive symptom is predicted by his or her own social support. For both PLH and their family members, the actor effects were negative. The actor effect for the family member was statistically significant and stronger than it was for the PLH; however, the difference between them was not statistically significant. The partner effect measures the degree to which a person's level of depressive symptom is predicted by his or her partner's social support. The partner effects for both PLH and family members were negative, but the partner effect for the PLH was stronger than it was for the family members. Neither of these partner effects was statistically significant. The actor effect and the partner effect for PLH were similar. The estimated correlation between the residuals for PLH and family members was 0.18 ($SE=0.12$), meaning that the levels of depressive symptoms reported by a PLH and by his or her family members were positively related while controlling for age, gender, and the actor and partner effects on social support measure.

We further observed significant age and gender effects in the model with the family relations reported by PLH and by family members. The actor effects for both PLH and family members were large, negative, and statistically significant, indicating that a person's own level of family relations was a significant predictor for their level of depressive symptoms. Similar to the results with social support, the actor effect for the family members was stronger. We observed that the partner effects for both PLH and family members were positive, meaning that a higher level of family relations from a person's partner increased that person's level of depressive symptoms. The partner effect for the family members was larger than that for the PLH, but none of them was statistically significant. The findings were different from those from the unadjusted analyses. The estimated correlation between the residuals for PLH and family members was 0.29 ($SE=0.11$; $p=0.0081$), which was higher than that different from the results with social support. This implies that the reports on depressive symptoms by PLH and by family members were more correlated after the family relations factor was included in the model.

Discussion

In this study, we found a higher level of depressive symptoms reported by PLH than family members. While HIV creates stress for all members of a family, PLH appear to be more susceptible to psychological distress than their family members, as implied by this study. Illness and associated challenges do impact a person's psychological states, especially for someone infected with HIV. Thus, it is not surprising to see a higher level of depressive symptoms reported by PLH than by family members. However, this study aimed to go beyond individual reactions to HIV. To achieve this, we present three different analytical approaches. First, we evaluated the relationships between each of the three measures

reported by PLH and their family members as well as those between different measures for PLH or for family members. We refer to this as *unadjusted analyses*. Next, we modeled the depressive symptoms reported by either PLH or family members using the multiple regression models with several predictors. Since this was based on one outcome at a time, we refer to this as *univariate adjusted analyses*. Lastly, the depressive symptoms reported by PLH and by family members within a family are more likely to be correlated, we modeled the paired depressive symptoms measures using the APIMs with the same set of predictors used in the univariate adjusted analyses. Since we analyzed the PLH and family member depressive symptoms simultaneously, we refer to this as *multi-level adjusted analysis*, which cannot be done in traditional regression analyses.

The most important finding of this study was not to confirm if social support or family relations are associated with depressive symptoms for PLH and family members. Rather, we focused on the relationship between PLH and their family members in a family context and examined the relationship between mental health and social support or family relations and how these measures jointly influenced mental health. According to Family Systems Theory (Bowen, 1966; Brown, 1999), well-being is influenced by the life experiences of each individual family member. According to this framework, the impact of HIV on a family should not be understood in isolation from only its individual members. In this study, we found that PLH and family member depressive symptoms were related to each other when examined using the APIMs, suggesting that the impact of HIV can have both direct and indirect influences on its members regardless of their HIV status. A PLH's psychological states, illnesses, and losses in functioning can be related to the mental health or well-being of their caregivers and family members. At the same time, family members' coping and mental health can also be associated with a PLH's psychological states. Ultimately, the quality of life for individual PLH and their family members may depend on how the family, as a whole, copes with various stressors associated with HIV.

This study also confirmed negative relationships between depressive symptoms and protective factors such as social support and family relations; these associations were stronger for FM than PLH participants. In China, the family forms an important safety net for PLH, and family members are the primary caregivers for treatment adherence, psychological support, child care, and, in most cases, financial support (Li et al., 2006). As family members cope with their own psychological challenges, they must carry out important roles as caregivers. They need to be supported in these roles, especially when their mental health needs are often underestimated or ignored by themselves or others. The significant relationship, indicated from the unadjusted and adjusted analyses, between mental health and social support reported by family member participants implies the need as well as where to intervene for this population.

The difference in the strength of associations with depressive symptoms was also found between social support and family relations. Inconsistent with previous findings that social support is related to decreased depression for PLH (Serovich et al., 2001; Vyavaharkar et al., 2009), no significant association was observed in this study. This may be due to the small sample size of the population. Consistent with other studies (Semple et al., 1997), however, we found that, in the unadjusted and adjusted analyses, family relations were significantly associated with depressive symptoms for both PLH and family members; this finding supported the important role of family relations in the psychological well-being of PLH and family members. It is worth noting that, in the unadjusted analysis, we observed that family relations reported by PLH and family members were highly correlated, but that for social support was trivial. One explanation for this could be related to the characteristics of the measurement—in a broad sense, the family relations indicator was measured based on observations at the family level. With statements such as, "Family members really help and

support one another” and “Family members always criticize each other,” PLH and family members assessed their “shared” experience within the family. It is not surprising to see that the reports from the two groups were correlated. On the contrary, perceived social support and depressive symptoms were measured with an individual focus (e.g., social support was measured based on the availability of support for a list of situations, such as, “Someone to take you to the doctor if you needed it” or “Someone to love you and make you feel wanted”). It is important for future studies to articulate factors at different levels and distinct “shared” and “non-shared” measures within a multi-level structure that includes both individual and family indicators.

Results from this study highlight the link between family experience and individual well-being, an important facet of Chinese culture. From early childhood, people in China are socialized for lifelong interdependence with others by developing skills and values that promote harmony (Bond, 1991). If the family unit is able to successfully overcome the challenges of HIV, the quality of life of all family members can be maintained. As HIV infections increase in China, more and more PLH and family members will rely on the strength of their families to cope with psychological stress and other HIV-related challenges. An opportunity exists to take a holistic approach to explore the effects of the epidemic at the family level and to generate understanding and information for policy development.

Two advantages in our analytical features are worth mentioning. First, the APIM on the correlated measures, as a key analytical approach, provided depth regarding “family” in this study. A traditional regression analysis may not be appropriate for describing data that may be dependent or correlated within a cluster (Campbell & Kashy, 2002; Cook & Kenny, 2005; Liang & Zeger, 1993; Weiss, 2005). A family is such a cluster, and the relationship found for one family member could be linked to that of others, given a common family situation such as HIV infection. Second, our APIM with a heterogeneous compound symmetry structure allows us to 1) explore how a person’s social support or family relations (independent variable) affects his or her own level of depressive symptoms (dependent variable), and his or her partner’s level of depressive symptoms, and 2) estimate the correlation of the residuals. O’Connor and colleagues (1998) elaborated on the difficulties of incorporating family systems ideas in research when they described family systems processes of families with adolescents. Based on the premise of Family Systems theory (i.e., that the whole is greater than the sum of its parts), we made an effort to go beyond the traditional models and attempted to explore the complex and interactive nature of the family coping processes. In this study, we reported relatively strong actor effects and insignificant partner effects in predicting depressive symptoms.

Several limitations must be mentioned. First, the cross-sectional design of the study prevents the establishment of causality, and the direction of effect between the protective factors and depressive symptoms cannot be teased out. Second, this study was conducted in an area with a large concentration of former plasma donors. Results may not be generalizable to HIV-positive individuals that were infected through other transmission routes. Third, we did not use HIV-specific measures in depressive symptoms, social support, or family relations. Although we believe that coping with HIV might be the biggest challenge to a family, it is true that there could be other issues that the family has to deal with. Without HIV-specific measures, we were not able to tease out the HIV-related and non-HIV-related social support, family support, and depressive symptoms. Also, a range of other possible factors that might have been related to depressive symptoms were not included in the study. Additionally, the study focused on depressive symptoms rather than depression, so findings may not generalize to a diagnosis of major depression.

Despite these limitations, this study has implications for designing and implementing appropriate interventions for families impacted by HIV. First, we underscore the importance of improving social support and family relations in the management of depression and psychological stress. Possible strategies may include strengthening the social support within families and building networks with other families living with HIV. In particular, empowerment mobilization may prove useful in helping families to develop better coping strategies so that they are able to provide PLH with better care and gain access to better resources. Second, family members who care for PLH may be at risk for depression due to the demands of caregiving. These family members need guidance and assistance, with future intervention programs assisting with stress management and coping strategies to improve mental health. Specifically, interventions should target PLH as well as their family members and focus on family relations and family capital as a whole.

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Table 1

Sample Characteristics of Study Samples at Baseline

Sample Characteristics	PLH (%) (N =79)	Family Member (%) (N =79)	Total (%) (N =158)
Gender			
Male	50 (63.3)	27 (34.2)	77 (48.7)
Female	29 (36.7)	52 (65.8)	81 (51.3)
Age			
35 or younger	16 (20.3)	17 (21.5)	33 (20.9)
36–40	22 (27.9)	26 (32.9)	48 (30.4)
41–45	26 (32.9)	21 (26.6)	47 (29.7)
46 or older	15 (19.0)	15 (19.0)	30 (19.0)
Marital status			
Married/living as married	71 (89.9)	70 (88.6)	141 (93.0)
Other	8 (10.1)	9 (11.4)	17 (7.0)
Education			
No schooling	11 (13.9)	22 (27.9)	33 (20.9)
Primary school	44 (55.7)	29 (36.7)	73 (46.2)
Junior high or higher	24 (30.4)	28 (35.5)	52 (32.9)
Occupation			
Full time farmer	41 (51.9)	41 (51.9)	82 (51.2)
Part-time farmer	21 (26.6)	18 (22.8)	39 (24.8)
Other	16 (21.6)	20 (26.3)	36 (22.9)
Annual Individual Income (Yuan)			
≤2000	38 (48.1)	35 (44.3)	73 (46.2)
2001~5000	26 (32.9)	23 (29.1)	49 (31.0)
5001 or more	15 (19.0)	21 (26.6)	36 (22.8)
Depressive Symptoms*			
Mean ± SD	20.9 ± 5.2	17.1 ± 5.2	19.0 ± 5.5
Social Support			
Mean ± SD	59.2 ± 13.5	55.4 ± 14.9	57.3 ± 14.3
Family Relations			
Mean ± SD	30.0 ± 3.6	31.0 ± 4.1	30.5 ± 3.9

*
 $p < 0.0001$

PLH—person living with HIV; FM—family member.

Table 2
Correlation Coefficients Among PLH and Family Member (FM) Measures

Variable	PLH Social Support	PLH Family Relations	FM Depressive Symptoms	FM Social Support	FM Family Relations
PLH Depressive Symptoms	−0.20	−0.22 *	0.20	−0.14	−0.01
PLH Social Support		0.18	−0.04	0.03	0.09
PLH Family Relations			−0.11	0.18	0.36 **
FM Depressive Symptoms				−0.46 **	−0.42 **
FM Social Support					0.44 **
FM Family Relations					1.00

* $p < 0.05$,
** $p < 0.001$.
PLH=person living with HIV; FM= family member.

Table 3

Univariate Regression Models For Predicting Depressive Symptoms

Predictor	Social Support			Family Relations		
	PLH	Estimate (SE)	p	PLH	Estimate (SE)	p
Intercept		26.8 (5.20)			34.2 (6.17)	
Age		-0.02 (0.09)	0.8301		-0.01 (0.09)	0.9227
Gender (M-F)		-1.20 (1.21)	0.3258		-2.06 (1.22)	0.0945
Social Support						
PLH		-0.07 (0.04)	0.1079			
FM						
Family Relations						
PLH					-0.39 (0.16)	0.0200
FM						
					-0.51 (0.13)	0.0003

PLH=person living with HIV; FM=family member.

Table 4

Actor-Partner Interdependence Models (APIMs) for Predicting Depressive Symptoms*

Predictor	Social Support		Family Relations	
	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>
Intercept	13.01 (1.818)		13.73 (1.790)	
Age	0.108 (0.043)	0.0127	0.105 (0.041)	0.0132
Gender (M-F)	-2.369 (0.745)	0.0021	-1.811 (0.744)	0.0171
Member (PLH-FM)	4.949 (0.725)	<.0001	3.765 (0.701)	<.0001
Actor Effects				
PLH	-0.053 (0.044)	0.2281	-0.424 (0.171)	0.0154
FM	-0.140 (0.034)	0.0001	-0.509 (0.139)	0.0005
Partner Effects				
PLH	-0.050 (0.041)	0.2256	0.079 (0.154)	0.6103
FM	-0.038 (0.037)	0.3024	0.126 (0.154)	0.4161

* Estimates are unstandardized regression coefficients.

PLH—person living with HIV; FM—family member.