The relationship between social support and anxiety among caregivers of children in HIV-endemic South Africa

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Abstract

Caring for children can be a source of joy and fulfilment, but also a source of stress, especially for caregivers living with illness and/or coping with difficult socio-economic conditions. Risks for poor caregiver mental health are especially salient in many parts of southern Africa affected by a generalised HIV epidemic, high rates of physical illness, difficult livelihood conditions and an increasing number of orphaned and vulnerable children in need of care. Given limited availability and low uptake of formal mental health services in South Africa, the potential protective role of informal community or 'social' resources for caregiver populations requires greater attention. To our knowledge, this is the first study to quantitatively assess the relationship between social support and symptomatic anxiety among caregivers of children living in HIV-endemic southern African communities. The data are from household survey interviews with 2477 adult primary caregivers of children aged 10-17 years living in two (urban and rural) resource-deprived HIV-endemic South African communities. Hierarchical logistic regression analysis with interaction terms was conducted to assess whether HIV and other illness were significant stressors for caregiver anxiety, whether social support had main or stress-buffering protective effects on anxiety, and whether gender moderated the association between social support and anxiety. Our findings showed significant main effects of social support on caregiver anxiety, but no evidence of stress-buffering effects of support or of gender moderating the support-anxiety relationship. This suggests that social support is a general mental health resource for both male and female caregivers of children in these HIV-endemic communities, regardless of whether they are facing specific stressors related to HIV or other illness. Our results highlight the importance of paying greater attention to the social environment when designing and implementing caregiver health interventions, and indicate that social support could be a valuable component of such interventions.

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Background

Caring for children can be a source of joy, pride and affection, even in very challenging situations. For adults living with HIV or other illness, it may even be a reason to live and fight disease (Gillespie, 2004). At the same time, however, taking care of multiple - biological and foster - children can be a source of stress and a mental health risk, especially in difficult financial and social conditions (Crosier, Butterworth, & Rodgers, 2007; Leder, Grinstead, & Torres, 2007; Musil, Warner, Zauszniewski, Wykle, & Standing, 2009; Reading, 2005). Moreover, evidence suggests that caregivers living with HIV or other illness may be particularly vulnerable to stress and poor mental health (Breuer, Myer, Struthers, & Joska, 2011; Prince et al., 2007; Silver, Bauman, Camacho, & Hudis, 2003; Surkan et al., 2010).

Risks for poor mental health are particularly salient in many parts of South and southern Africa, affected by a generalised HIV epidemic and high rates of physical illness, difficult livelihood conditions and an increasing burden of care for orphaned and vulnerable children taken on mainly by extended families (Baylies, 2002; Kuo & Operario, 2009; Norman, Bradshaw, Schneider, & Groenewald, 2006; UNAIDS, 2010). A South African nationally representative survey found that approximately 30% of the population had a lifetime mental health disorder; anxiety disorders were the most prevalent at around 16% (Herman et al., 2009). Recent survey research conducted with caregivers of children in a poor HIV-endemic community in South Africa's KwaZulu-Natal province showed that over 60% of these caregivers were experiencing moderate or high anxiety (Kuo & Operario, 2011). This is concerning for both the wellbeing of caregivers and the children in their care, as worse caregiver mental health has been shown to pose challenges for parenting and child health (Smith Fawzi et al., 2010; Stein, Ramchandani, & Murray, 2008).

In the South African context of limited mental health resources and low uptake of available services (Seedat et al., 2009; World Health Organisation, 2011), the potential protective role of informal community or 'social' resources for caregiver populations beckons greater attention. Social support has been referred to as the "positive, potentially health promoting or stress-buffering, aspects of relationships such as instrumental aid, emotional caring or concern, and information." (House, Umberson, & Landis, 1988, p. 302). It has been found to be a positive mental health resource for various adult populations, including ill adults and caregivers of children (Gerard, Landry-Meyer, & Guzell Roe, 2006; McDowell & Serovich, 2007; Musil, et al., 2009; Reich, Lounsbury, Zaid-Muhammad, & Rapkin, 2010). More specifically, empirical studies conducted over the past four decades have shown social support to have a direct relationship with better mental health (that is, to have main or general health sustaining effects), and/or to buffer effects of stress on mental health[i], including stressors related to HIV and other illness (Casale & Wild, 2012a; House, et al., 1988). While neither main nor stress-buffering effects of social support have been found

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[i]Main effects occur when social support is directly associated with better health outcomes, indicating that people with more social support have better mental health outcomes regardless of the presence or level of stress (Casale & Wild, 2012a; House, et al., 1988). Stress-buffering indicates that social support attenuates the negative effects of stress or specific stressors on the mental health outcome (House, et al., 1988; Kaplan, Cassel, & Gore, 1977), so that the association between stress/stressors and worse mental health is stronger for individuals with low social support than for individuals with high social support.

uniformly across studies, it should be noted that main effects have been more frequently observed (House, et al., 1988; Thoits, 2011).

Most studies investigating the social support-mental health relationship among adult populations to date have, however, been conducted in the developed world, and most have focused on psychological distress or depression as outcomes (Casale & Wild, 2012b; House, et al., 1988; Uchino, Bowen, Carlisle, & Birmingham, 2012). This is the first known study to quantitatively assess the relationship between social support and symptomatic anxiety among caregivers of children living in HIV-endemic southern African communities. It is also the first known study conducted with comparison groups of caregivers living with HIV, caregivers living with other illness, and 'healthy caregivers' (without a self-reported health condition), in order to determine the distinct associations between HIV/AIDS and other illness on anxiety, and the potential stress-buffering role of social support for these respective stressors. Moreover, given evidence of higher mental health disorder rates and a stronger protective effect of social support among women (Kendler, Myers, & Prescott, 2005; Oppong, 2012; Schraedley, Gotlib, & Hayward, 1999; Schwartzer & Leppin, 1989; Walen & Lachman, 2000; World Health Organisation, 2012), this analysis also aims to assess whether gender moderates the association between social support and anxiety. Determining whether social support is a positive resource for caregiver mental health more generally, and/or has particular protective effects for specific groups of caregivers (e.g. caregivers living with HIV-related or other illness; male versus female caregivers) would be valuable in informing decisions around health programme design and priority end-users. Moreover, exploring the protective effects of informal social support on health with less-researched and vulnerable populations is important in light of evidence that these effects are not uniform across groups in society, but depend on the interaction of factors such as the types of stressors, types of support and the individual context (Kawachi & Berkman, 2001; Li, Seltzer, & Greenberg, 1997; UNAIDS, 2010; Wallen & Lachman, 2000).

The data are from survey interviews with 2477 adult (18 +) primary caregivers[ii] of children aged 10-17 years living in two (urban and rural) resource-deprived HIV-endemic communities in the Kwazulu-Natal province, South Africa. The aim of this analysis was to determine: a) whether living with HIV/AIDS or a non-HIV-related illness was associated with a greater likelihood of anxiety among caregivers, compared to caregivers without a health condition; b) whether social support was directly associated with less anxiety among caregivers (main effects); c) whether gender moderated the association, if any, between social support and anxiety; d) whether social support buffered the effects of HIV/AIDS and other-illness-related stressors on anxiety (stress-buffering effects).

Method

Sampling and Procedure

The data used was collected in 2009 and 2010 as part of a larger household health survey with 2477 caregiver-child pairs[iii]. The two Kwazulu-Natal field sites were selected based on

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[ii]A primary caregiver was defined as the individual who takes responsibility for primary childcare duties to address the economic, social, and psychological needs of the child, whether a biological or foster parent.

HIV prevalence rates (30% HIV prevalence among antenatal clinic attendees) (Department of Health, 2008), provincial health deprivation indices[iv] (Noble et al., 2006) and their respective representative urban and rural nature (urban and rural distinctions based on reasoning used in Statistics South Africa, 2003). Within research sites, stratified random sampling of areas representing the smallest political boundary was conducted[v]. Trained interviewers went from door to door in each selected area to determine household eligibility, obtain informed consent and conduct the interviews; given the interest in ensuring a large enough subsample of ill caregivers, interviews with (self-reported) ill adults caring for children were prioritized in households where both ill and healthy caregivers of children 10-17 were present. In the case of more than one eligible caregiver-child pair in the same household, the pair to interview was randomly selected (by, for example, flipping a coin or throwing dice). Interviews lasted between forty-five to sixty minutes and were conducted in the local language. Approval to conduct the research was obtained from the relevant provincial health and education government departments, as well as community gatekeepers (ward councillors or tribal leaders). Ethical approval was granted by the Social Sciences and Humanities Research Ethics Committee at the University of KwaZulu-Natal and the Social Sciences and Humanities Inter-Divisional Research Ethics Committee at the University of Oxford.

Tools and measures

Survey measurement tools were chosen based on their psychometric properties, their appropriateness for non-clinician interviews and their previous validation or use with similar populations.

Illness status

The HIV status of the caregiver was identified using an algorithm based on self-reported HIV-status and the verbal autopsy (VA) questionnaire. The VA was developed to identify symptoms of AIDS in areas with over 20% HIV-prevalence and unreliable data on cause of death or illness (Hosegood, Vannestea, & Timæus, 2004; Lopman et al., 2006; Setel et al., 2006). 'Other illness' status was assessed through questions on illnesses and symptoms pertaining to the most common causes of adult illness in South Africa, as identified in the South African Demographic and Health Survey (Department of Health, Medical Research Council, and ORC Macro, 2007) and the Health Systems Trust Annual Review (Health

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[iii]The research was a partnership between the Health Economics and HIV and AIDS Research Division (HEARD) at the University of KwaZulu-Natal, the University of Oxford, Brown University and various South African government departments and NGOs. The survey aim was to examine the impact of living in an AIDS-affected family on the health of children and their caregivers, in order to identify risk and protective factors. Further information on the survey research project is available at the following website: www.youngcarers.org.za.
[iv]Wards within the urban municipality were narrowed down to those with only urban households and that fell within the top quintile (20%) of deprived wards, according to the Noble et al (2006) provincial health deprivation indices. The latter selection criterion served to avoid selection of a ward with 'pockets' of wealth, given the high level of socio-economic inequality within the urban municipality.
[v]The smallest political boundaries in the urban site were (census) wards, headed by Ward Councillors, and in turn divided into multiple census enumeration areas. The smallest political boundaries in the rural site were represented by tribal communities or 'Isigodi', each headed by a tribal leader or Induna.. Approval to conduct the research was sought and obtained from each individual gatekeeper (Ward Councillor or tribal leader/Induna). Two wards, consisting of 34 enumeration areas, were covered in the urban site, while 12 communities or 'Isigodi' were covered in the rural site.

Systems Trust, 2006); these included asthma, diabetes, arthritis, cancer, low or high blood pressure, epilepsy and hypertension.

Social support

The Medical Outcomes Study Social Support Survey (MOS-SSS) was used to measure perceived availability of functional support (Sherbourne & Stewart, 1991), including emotional, informational and tangible support and positive social interaction. The MOS-SSS has strong psychometric properties (α=0.97; 1-year test-retest reliability = 0.78) (Sherbourne & Stewart, 1991), and has been widely applied in the developing world, including with HIV-positive individuals in South Africa (Gaede et al., 2006; Westaway, Seager, Rheeder, & Van Zyl, 2005). It is a 20-item tool through which respondents are asked to rate how often each type of support is available if they need it, based on a 5-options scale from 'none of the time' (1) to 'all of the time' (5). These responses are scored together to derive a mean support index, ranging from 1 – 5, with higher scores representing higher levels of perceived support.

Anxiety

The Beck Anxiety Inventory (BAI) was used to assess symptoms of anxiety (Beck & Steer, 1993). This tool has been widely used in many different cultural contexts and various languages, including in research and clinical settings in South Africa (see for example: Faure & Loxton, 2003; Pillay, Edwards, & Sargent, 2001; Pillay & Sargent, 1999; Steele & Edwards, 2008). The BAI has been shown to have a high internal consistency with coefficients ranging between .90 and .94 and test retest reliability of 0.75 (Beck, Epstein, Brown, & Steer, 1988; Beck & Steer, 1993; Steele & Edwards, 2008). It is a 21-item instrument through which respondents indicate to what extent they have been bothered by symptoms experienced over the past month, based on a four-point scale ranging from 'Not at all' (0) to 'Severely' (3). Responses are aggregated to compute a total score between 0 and 63. Scores between 0 and 7 indicate very low or normal anxiety; between 8-15 mild anxiety, 16-35 moderate anxiety and above 26 high anxiety (Beck & Steer, 1993). A categorical variable was created to denote the presence (score of 8+) or absence (scores between 0 and 7) of some level of anxiety.

Analysis approach

Data was analysed using SPSS 21. Bivariate statistical tests were conducted to assess differences in socio-demographic characteristics, health outcomes and social support scores by gender and illness status. Consistent with previous studies assessing effects of social support on mental health with similar populations (Klein et al., 2000; Mellins, Ehrhardt, Rapkin, & Havens, 2000), hierarchical logistic regression analyses with interaction terms were conducted with the entire sample of caregivers to test for both direct (main) effects and moderation (stress-buffering) effects of social support on anxiety, as well as for moderating effects of gender on the direct (main effect) relationship, if any, between social support and anxiety. The two stressors included in the model were HIV/AIDS-illness and other illness. Binary (0/1) variables were created to denote the absence or presence of each of these stressors. The gender variable was computed so that '1' indicated female gender and '0' male gender. Three interaction terms were then created by respectively multiplying each of

these two stressor variables and the gender variable by the mean-centered continuous social support score (Holmbeck, 1997). Socio-demographic control variables and stressors (HIV and other illness) were entered in the first regression model and social support was added in the second model. The interaction of gender and social support was included in model 3. The interaction of stressors and social support was tested in the last model (model 4).

The socio-demographic variables included in the regressions were age, gender, location (urban versus rural), education and socio-economic status[vi], factors previously found to be associated with mental health among HIV-positive individuals and adult caregivers (Brandt, 2009; Crosier, et al., 2007; Herman, et al., 2009; Lv et al., 2010; Patel & Kleinman, 2003; Pinquart & Sorensen, 2007; Whetten, Reif, Whetten, & Murphy-McMillan, 2008; World Health Organisation, 2001; Zinkernagel et al., 2001). Associations were reported as significant where the *p* value was less than 0.05.

Results

Participant characteristics

Table 1 contains descriptive statistics for the entire sample, and for males and females respectively. The majority (89%) of caregivers were female and the mean age was 44 years; over 99% defined themselves as Black African and 96% indicated that their mother tongue was Zulu. Approximately 40% of the population reported members of their household experiencing hunger at least occasionally; 44% did not have access to running water in their dwelling or yard, and about half of participants (49%) did not have access to electricity. Twenty-eight per cent of caregivers were defined as HIV-positive and/or AIDS-ill, 37% other ill and the remaining 35% healthy. On average, male caregivers reported higher education (*p*<.001) and higher mean social support scores (*p*<.05), while non HIV-related illness (*p*<.01) and anxiety (*p*<.001; 39% versus 51%) were more common among female caregivers.

Table 2 contains descriptive statistics for socio-demographic variables, social support and anxiety by caregiver illness status. Findings show that a much lower proportion of (HIV or other) ill caregivers had completed high school (*p*<.001) compared to healthy caregivers, and HIV-positive caregivers had lower socio-economic status than both other ill and healthy caregivers (*p*<.001). A larger proportion of HIV-positive caregivers were from the rural site (67%) whereas a larger proportion of caregivers with other illness were from the urban site (61%). The proportion of HIV-positive caregivers experiencing anxiety (66%) was higher than the proportion of other ill caregivers with anxiety (54%) which was in turn considerably higher than the anxiety rate among healthy caregivers (31%) (*p*<.001). There were, however, no significant differences in the mean social support score across the three groups.

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[vi]Socio-economic status was measured using Booysen's (2001) South African economic asset index, based on factor and principal component analysis of variables relating to ownership of consumer goods, household size and dwelling characteristics, and access to services and resources (Booysen, 2001; Filmer & Pritchett, 2001); this has been found to be a reliable tool in the South African context (Filmer & Pritchett, 2001; Montgomery, Gragnolati, Burke, & Paredes, 2000).

Regression analysis results

Results of the hierarchical logistic regression analyses are illustrated in Table 3. Model 1 shows that a higher age (p<.001) and gender (being female) (p<.01) were associated with higher odds of anxiety, while a higher education level (p<.001) and better socioeconomic status (p<.01) were associated with lower odds of anxiety. After controlling for socio-demographic factors, both HIV/AIDS and other illness were found to be positively associated with more caregiver anxiety, though odds ratios show that HIV/AIDS was the stronger predictor (OR for HIV/AIDS=3.53; p<.001; OR for other illness = 2.06; p<.01). Social support (included in model 2) was found to significantly decrease the odds of anxiety, indicating a main effect of social support on anxiety (OR=0.84; p<.001). However, the interaction term between gender and social support (included in model 3) was not significant, indicating that being female did not moderate the association between social support and anxiety. Similarly, neither of the interaction terms between illness and social support (included in model 4) was statistically significant, suggesting that social support was not moderating the effects of HIV- or other- illness related stress on anxiety among this sample of caregivers.

Discussion

While a comparison of exact anxiety rates found by other studies is not possible, due to different sampling procedures and instruments used[vii], it should be noted that the proportion of caregivers experiencing some level of anxiety in our sample (49%) was considerably higher than the estimated national prevalence rate of anxiety for South Africa (16%) (Herman, et al., 2009), and more in line with findings of a recent survey with a similar population of caregivers in HIV-endemic KwaZulu-Natal (60%) (Kuo & Operario, 2011). The descriptive data and regression results indicate that the high anxiety rate for this population was in part explained by the effects of (HIV-related or other) illness. However, even for healthy caregivers, the prevalence of anxiety (31%) was considerably greater than the national survey figures, suggesting that poverty and other social challenges, as well as stresses related to child caregiving, were likely contributing to anxiety in this population. Also, in line with the national data and broader literature, the prevalence of anxiety in our sample was higher among women; this was supported by the regression analysis showing gender (being female) to be significantly associated with more anxiety, when controlling for age, education and socio-economic status.

Results of this analysis also show a direct association between social support and anxiety (main effects), suggesting that social support is a positive general resource for mental health among caregivers in these HIV-endemic communities. However, our data does not provide evidence of a stronger direct relationship between more social support and less anxiety for women than for men. It should be noted, however, that, previous literature showing gender differences in the relationship between social support and mental health focused predominantly on depression as a mental health outcome (Kendler, Myers, & Prescott, 2005;

[vii]Herman et al (2009) reported on the South African Stress and Health study that measured anxiety using the Composite International Diagnostic Interview (CIDI). Kuo and Operario (2011) measured anxiety using the Kessler scale (K10).

Schraedley, Gotlib, & Hayward, 1999); findings may therefore not be generalizable across populations or for other mental health outcomes.

Also, findings of this analysis do not provide evidence of social support buffering against the negative effects of HIV/AIDS or other illness on anxiety among caregivers in this sample. As indicated above, this is consistent with the empirical work conducted on social support and adult health to date, which has more frequently shown main effects of support on mental health (House, et al., 1988; Lakey & Orehek, 2011). These results suggest that social support is a protective factor for the mental health of all caregivers in this community, regardless of the presence or level of stressors related to HIV or other illness. It has been argued that main effects of social support on mental health can be explained through ordinary, regular social relations and support from specific providers (rather than a focus on stress and coping specifically) (Lakey & Orehek, 2011; Thoits, 1985). In both stressful and non-stressful situations, these relationships may result in better mental health through various mechanisms, for example by providing people with regular positive experiences, stability (Cohen & Wills, 1985), positive social control (Lakey & Orehek, 2011) and/or social roles resulting in a sense of identity, belonging and self-esteem (Thoits, 1985). Some of these mechanisms may be possible explanations for our findings of main effects of social support on mental health for this sample of caregivers, who are likely dealing with multiple stressors including illness, poverty and challenges linked to child caregiving.

This analysis has various strengths, including the large sample size and ability to disaggregate the data by caregiver health status. Its limitations include possible inaccuracies and bias inherent in self-reported data, such as recall bias, reporting bias and misclassification. Determining AIDS-illness through the verbal autopsy (VA) also involves a degree of error: a validation study in Zimbabwe showed a sensitivity of 83% and a specificity of 75% for AIDS-related deaths, while an earlier South African validation study found a sensitivity of 89% and a specificity of 93% for deaths caused by AIDS and other communicable diseases (Kahn, Tollman, Garenne, & Gear, 2000; Lopman et al., 2006). Moreover, as this is analysis of cross-sectional data it, is not possible to infer causality.

Conclusion

Our findings show social support to be a general mental health resource for both male and female caregivers of children in these HIV-endemic communities, regardless of whether they are facing specific stressors related to HIV or other illness. These results highlight the importance of paying greater attention to the social environment when designing and implementing health interventions (Prince, et al., 2007). They also suggest that social support could be a valuable component of mental health interventions working with male and female caregivers of children, whether or not they are living with HIV/AIDS or other illness. This may be particularly important in situations of limited formal mental health facilities and low uptake of existing services, such as that of South Africa. On the one hand, social support components could be included within broader health programmes, for example through support groups, health providers or interventions aimed at strengthening existing networks (Davies, Hortona, Williams, Martin, & Stewart, 2009; Mason & Vazquez, 2007; Mitrani, McCabe, Robinson, Weiss-Laxer, & Feaster, 2010). On the other, there may

be opportunity for existing informal support networks and initiatives to serve as a platform for psycho-educational initiatives and higher uptake of formal health services. Future research should focus on the design and evaluation of social support components for interventions with similar populations. In this respect, it would also be useful to better understand the various mechanisms through which social support may be positively affecting caregiver mental health, both in stressful and non-stressful situations (House, et al., 1988; Uchino, et al., 2012; Thoits, 2011).

Acknowledgments

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Table 1

Socio-demographic, Health and Social Support Characteristics for Whole Sample and by Gender

Variables	Total sample (n = 2477)	Females (n=2199)	Males (n = 278)	Chi-square value	t-value	p value for differences between males and females
Socio-demographic variables						
Age (mean, SD)[1]	44.2 (13.9)	44.3 (13.8)	43.4 (14.4)		1	ns
Completed high school (%)[2]	18.1	16.9	27.5	18.8		<.001
Two highest socio-economic quintiles (%)	40	39.4	44.6	2.8		ns
Urban (%)	48.4	47.6	54.7	5		<.05
Caregiver health conditions						
HIV/AIDS (%)	27.7	27.6	27.7	0		ns
Other illness (%)	36.7	37.6	30.2	5.7		<.05
Anxiety (%)	49.4	50.7	39.2	13.1		<.001
Orphan presence in home						
Children orphaned by AIDS in household (%)	16.3	16.5	14.4	0.8		ns
Children orphaned by other causes in household (%)	55.3	56.4	46.4	10.0		<.01
Social support						
Social support score (mean, SD)	3.6 (1.3)	3.6 (1.3)	3.8 (1.2)		−2.9	<.05

[1] n = 274 for male caregivers for this variable, due to 4 missing values

[2] n = 2183 for female caregivers for this variable, due to 16 missing values

Table 2

Differences in socio-demographic characteristics, social support and anxiety levels for HIV-positive, other ill and healthy caregivers

Variables	HIV-positive (n= 685)	Other ill (n=910)	Healthy (n = 882)	Chi-square value	F - value [3]	p value for differences between groups
Age (mean, SD)	42.3 (11.6)	51.2 (14.2)	38.5 (11.9)		236.3	<.001
Completed high school (%)	10.3	12.2	30.2	136.3		<.001
Two highest socio-economic quintiles (%)	28	48.2	40.8	66.9		<.001
Urban (%)	33.1	61.2	46.9	124.4		<.001
Female (%)	88.8	90.8	86.7	7.3		<.05
Social support score (mean, SD)	3.5 (1.3)	3.7 (1.2)	3.6 (1.3)		1.7	ns
Anxiety (%)	66	54.4	31.4	198.7		<.001

[3] *F*-value associated with One-Way ANOVAs

Table 3

Results of Hierarchical Logistic Regression Analyses Predicting Caregiver Symptomatic Anxiety (n = 2457)

	Model 1 OR (CI)	Model 2 OR (CI)	Model 3 OR (CI)	Model 4 OR (CI)
Socio-demographic variables				
Age	1.02*** (1.01–1.02)	1.02*** (1.01–1.02)	1.02*** (1.01–1.02)	1.02*** (1.01–1.02)
Higher socio-economic status	0.77* (0.62–0.95)	0.82 (0.66–1.02)	0.82 (0.66–1.02)	0.82 (0.66–1.02)
Completed high school	0.54*** (0.42–0.70)	0.58*** (0.45–0.75)	0.58*** (0.45–0.75)	0.58*** (0.45–0.75)
Urban	0.88 (0.72–1.09)	0.87 (0.71–1.07)	0.87 (0.70–1.07)	0.87 (0.71–1.07)
Gender (female)	1.48** (1.12–1.95)	1.44** (1.09–1.89)	1.42* (1.07–1.88)	1.44* (1.09–1.90)
Stressors related to illness				
HIV/AIDS	3.53*** (2.83–4.39)	3.61*** (2.90–4.51)	3.62*** (2.90–4.52)	3.60*** (2.89–4.49)
Other illness	2.06*** (1.66–2.55)	2.12*** (1.71–2.63)	2.12*** (1.71–2.63)	2.13*** (1.72–2.65)
Social support				
Social support score		0.84*** (0.79–0.90)	0.81 (0.66–1.00)	0.86** (0.77–0.96)
Interactions				
Gender (female) × Social support score			1.04 (0.84–1.30)	
HIV/AIDS × Social support score				0.99 (0.84–1.18)
Other illness × Social support score				0.94 (0.81–1.10)
Model statistics				
Nagelkerke R^2	0.15	0.16	0.16	0.16
Chi-square	297.41***	322.50***	323.15***	322.63***

*
p < .05

**
p < .01

***
p < .001