

The role of parenting in affecting the behavior and adaptive functioning of young children of HIV-infected mothers in South Africa

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Abstract

Prior investigations suggest that maternal HIV/AIDS poses significant challenges to young children. This study investigates the relationships between mothers' psychological functioning, parenting, and children's behavioral outcomes and functioning in a population of women living with HIV (N=361) with a child between the ages of 6 and 10 -years in Tshwane, South Africa. Utilizing path analysis, findings revealed that maternal depression is related to increased parenting stress and parent-child dysfunction, maternal coping is related to parenting style, and maternal coping, parenting style and stress, and parent-child dysfunction are associated with children's behavior and functioning, with parenting emerging as an important mediator. These findings suggest that interventions for women living with HIV and their children should not only address maternal psychological functioning (depression and coping), but should also focus on parenting, promoting a positive approach.

Keywords: Maternal HIV/AIDS, child behavior, parenting, coping, OVC, South Africa

Introduction

The AIDS epidemic in sub-Saharan Africa has exerted an exacting toll on very young children of women living with HIV. The burden of HIV/AIDS in the region is unparalleled, as it is home to nearly 68% (approximately 22.9 million people) of all individuals living with HIV globally, 59% of whom are women (WHO, 2011). Women of childbearing age are highly impacted; in 2010 there were 1.36 million pregnant women living with HIV in sub-Saharan Africa. South Africa continues to bear the largest global burden of any nation with an estimated 5.6 million people living with HIV. For those who have access to treatment, HIV infection is

now considered a chronic illness, although it remains life-threatening. However, these improvements in prevention and treatment have only relatively recently been implemented in parts of the developing world, resulting in a differential impact of the HIV/AIDS epidemic upon children living in lower resourced settings. According to the United Nations Children's Fund (UNICEF), 95 percent of all women living with HIV live in resource-poor countries, with 3.3 million positive women (age 15 years and older) living in South Africa (UNICEF, 2012). Many of these women are of child-bearing age and there are thus millions of HIV-affected young children potentially having to cope with maternal illness and associated structural and psychological stressors.

Mental Health of Women Living with HIV and Impact on Children

Women living with HIV in sub-Saharan Africa are at high risk of psychiatric morbidity (Brandt, 2009). Illness-related stress, structural and societal stressors such as poverty (Bachmann & Booysen, 2006; Kalichman & Grebler, 2010), gender inequality (Brandt, 2009), and lack of access to mental health services (Saxena et al., 2007) create a high risk environment for psychological distress in HIV-positive women and their children. Poor mental health is associated, although not uniformly, with worse HIV illness outcomes (review, see Evans et al., 2002; Leserman et al., 1999) and depressive symptoms have been related to increased risk of disease progression and mortality (Cook et al., 2004; Leserman, 2003; Schuster, Bornovalova & Hunt, 2012). Although not as widely documented in sub-Saharan African and US-based minority populations, the association between depression and illness progression has been demonstrated among HIV-infected pregnant women and new mothers in Tanzania (Antelman et al., 2007) and

associated with increased subjective somatic complaints in Ugandan (Kaharuza et al, 2006) and African-American populations (Jones, Beach, & Forehand, 2001). Women living with HIV are up to three times as likely to self-report high anxiety compared to uninfected women (Van Servellen et al., 1998) and women of reproductive age may be most at risk (Ivanova et al., 2012). Maternal depression, in particular, has been widely identified in the literature as a negative predictor of children's psychosocial functioning (Dix & Meunier, 2009; Hoffman et al., 2006; Murray & Cooper, 2003) and general maternal psychological distress has been related to children's behavior problems (Bauman et al., 2002).

Along with direct maternal influence, broader family functioning is critically important to children's well-being (Chandan and Richter, 2009). Families provide the frontline response for caregiving in the context of maternal HIV/AIDS (Chandan & Richter, 2009) and family functioning is likely very influential in children's adaptation to familial HIV/AIDS in high prevalence settings (Heyman, Earle, Rajaraman, Miller, & Bogen, 2007). Despite high environmental stress, and in particular changes in family-and caregiving structures, South African culture continues to value the extended family and utilize social networks to cope with HIV-related stress. As the psychological functioning of children is linked to the family environment (Rotheram-Borus, Flannery, Rice, & Lester, 2005; Steele & Mayes, 2001), psychosocial intervention in the African context has focused upon community collaborative models and family level participation (Baptiste, et al., 2006). Harnessing the strength of families for HIV/AIDS intervention in the developing world is considered critical (Rotheram-Borus, Flannery, Rice, & Lester, 2005; Rotheram-Borus et al., 2010).

Maternal HIV: Parenting and Child Adjustment

Maternal HIV can have a deleterious impact on uninfected and infected children's developmental outcomes, psychological functioning, physiological morbidity, and mortality (Chandan & Richter, 2009; Hong, 2008). Although the mechanisms are not fully clear, particularly in the developing world context with risks associated with chronic and cumulative stressors synonymous with scarce-resource contexts, compromised parenting and childcare practices are very likely contributing to the indirect effects of maternal HIV upon uninfected children (Murphy et al., 2010; Stein et al., 2005). The associated stressors of HIV can compromise a woman's mental health, which relates directly to her parenting capacity (Murphy et al., 2010). A review of 152 studies identified processes by which maternal depression negatively impacts parenting, including increased negative appraisals of child behavior, low perceived parenting competence, use of coercive parenting, reduction of child-oriented goals, low attention to child emotional expression, and low-positive and high-negative emotion in the context of parenting (Dix & Meunier, 2009). Depressed mothers also utilize less effective parenting strategies (Hoffman, Crnic, & Baker, 2006) accompanied by maladaptive parenting behaviors such as neglect, physical assault, and psychological aggression (Turney 2011), and their children exhibit higher numbers of behavioral problems and emotional dysregulation (Hoffman, Crnic, & Baker, 2006). Aspects of positive parenting, including adaptability, a good parent-child relationship, (Bauman et al., 2002), parental warmth (Jones et al., 2008; McKee et al., 2008), and positive parental bonds (Rotheram-Borus, Stein, & Lester, 2006) have been shown to be protective and related to better child psychological functioning, including long term reduction of emotional distress and increased positive future expectations (Rotheram-Borus,

Stein, & Lester, 2006). Further, concurrent maternal sensitivity in the context of depression may buffer against the negative impact of a mother's depressive symptoms upon her child (Tomlinson, Cooper, & Murray, 2005). Specifically in the context of parenting skills of women living with HIV, higher numbers of family routines and higher, more consistent parental monitoring are associated with lower rates of anxiety, depression, and substance use of children (Murphy et al., 2009). Given these findings, parenting has been identified as a primary target of intervention to bolster functioning of young children affected by HIV/AIDS (Chandan & Richter, 2009).

Severity of maternal illness may play a role in children's adjustment and psychosocial functioning. The literature is not consistent regarding exact mechanisms by which maternal HIV negatively impacts the psychological health of children, although there is some evidence that poorer overall maternal health (evidence of illness to the children) is associated with worse children's mental health indices (Mellins et al., 2008).

Given the high prevalence of children affected by maternal HIV/AIDS in sub-Saharan Africa and indications from the literature that these mothers' mental health and parenting may be negatively impacted by HIV/AIDS, there is critical need for increased clarity regarding the mechanisms by which maternal HIV/AIDS impacts children's behavior and functioning. In this paper, we report on the strength of predictive pathways within a theoretical model of the relationships between maternal psychological functioning, maternal illness severity, parenting, sociodemographics, and child psychological outcomes in the context of maternal HIV/AIDS. Our team developed this theoretical model to guide the content and delivery of our group-based maternal child psychosocial intervention aimed to bolster resiliency of young, uninfected children of HIV-positive mothers. We implemented a randomized clinical trial of the group-

based intervention in Tshwane, South Africa and the current analysis uses cross-sectional data collected at baseline of the trial. We hypothesized that maternal psychological variables (depression and coping) influence parenting variables (parenting stress and parenting style) and that parenting influences child adaptive functioning (communication, daily living skills, socialization) and behavior (internalizing and externalizing symptoms). Additionally, we hypothesized that maternal illness in the prior three months would predict poorer child psychosocial outcomes via higher parenting stress with less positive parenting strategies.

Methods

Participants

Participants (N=361) included HIV positive women with a child between the ages of 6 and 10 years living in one of two township communities in Tshwane, South Africa and recruited from local primary health clinics and immunology clinics in the area. Additional inclusion criteria included HIV-negative status of the children (according to maternal report) and primary caregiver status of the mothers.

Procedures

Trained research assistants at local primary health clinics and immunology clinics in Tshwane, South Africa, recruited eligible HIV-positive women. The research assistants explained the aim of the trial to the mothers and completed an initial screening questionnaire to ensure that the family characteristics met the inclusion criteria. If the mother indicated interest in

pursuing the study, the research assistant read and explained the consent form to the mother and requested her signature.

The interviews were carried out by eight skilled research assistants, all of whom were fluent in both English and one or more of the following languages: Sepedi, Sesotho, Setswana and Isizulu. The research assistants received extensive training in administration and scoring of the study instruments from a clinical child psychologist with expertise in pediatric and parental assessment. The completed paper-format interview was entered directly into the computer by the research assistants, using the Questionnaire Development System QDS™ software. The project coordinator checked the entered data before the statistician exported the data to Statistical Package for the Social Sciences (SPSS), Version 17. The mothers and their children received 30 Rand and 20 Rand respectively in order to cover their transportation costs. The children also received a toy (worth 10 Rand or approximately 1.5 dollars) as appreciation for their participation in the study.

Measures

Prior to data collection, cultural advisors (local research assistants and representatives from the communities involved in the research) reviewed the study battery for cultural relevance and sensitivity. The measurement battery was translated by an outside agency into the four languages utilized in the study and was back-translated by a different translator. The translated and back-translated versions were again presented to the cultural advisors for review and queries were referred back to the translators. The translated measures were then piloted with 20 mothers for a final refinement. The entire assessment was conducted in interview format for mothers and took approximately 30 to 45 minutes to complete.

Maternal assessment

Sociodemographic characteristics. The interview assessed maternal and family sociodemographic characteristics, including maternal and child age, maternal employment status, education level, partner status, total number living in the home, and socioeconomic status (SES). As a measure of socioeconomic status, the women were asked a series of five questions regarding their homes, including whether or not there was running water, a flushing toilet, a refrigerator, electricity, and whether the home was built of brick or cement rather than more temporary construction materials. These responses were tallied to create a “housing index” with a score from 0 to 5. Clinical characteristics of the mother’s physiological functioning with HIV/AIDS were also obtained via maternal report, from which illness severity was determined. Mothers were considered to have been ill in the prior three months if they had had non-specific symptoms (unintentional weight loss of more than five kilograms or fatigue that interfered with daily activities lasting for more than two weeks) or they had an AIDS-related illness, consistent with WHO clinical staging 3 or 4 which includes diagnoses such as presumed pneumonia and persistent oral thrush. Women who reported no symptoms or only mild symptoms consistent with stage 1 disease (e.g. rash) and did not have unintentional weight loss or fatigue were considered to be non-symptomatic.

Maternal psychological characteristics. *Maternal depression* was measured with the Center for Epidemiologic Studies – Depression Scale (CES-D; Radloff, 1977). This scale consists of 20 items querying frequency of feelings experienced in the past week using a 4-point Likert scale ranging from “rarely or none of the time” to “most or all of the time”. For analysis, five items pertaining to somatic symptoms were excluded because some symptoms could be attributed to HIV disease or to pregnancy (12% of the sample was pregnant; Kalichman & Grebler, 2010). Internal reliability in our sample was excellent ($\alpha = 0.871$). *Maternal general coping* was assessed via The Brief COPE (Carver 1997), which asks the respondent to indicate

how often she utilizes particular strategies to cope with stressors. Responses are provided on a four-point scale ranging from “I haven’t been doing this at all” to “I’ve been doing this a lot”. The Brief COPE is comprised of 14 subscales each consisting of two items; for more robust subscales, we conducted a factor analysis on data from our sample and, based upon those results, we combined the items into two subscales for use in the current analysis: avoidant ($\alpha = 0.704$) and active ($\alpha = 0.731$) coping mechanisms. *Maternal religious coping* was measured via the Religious Coping Scale (Pargament et al, 2000), which assesses the degree and types of religious thinking and behavior respondents utilize to cope with stressors. The Religious Coping Scale consists of 14 items with a 4 point Likert response scale ranging from “I have not been doing this at all” to “I have been doing a lot of this”. Two subscales, positive religious coping ($\alpha = 0.833$) and negative religious coping ($\alpha = 0.795$), were used in the current analysis.

Maternal parenting characteristics. *Parenting* was assessed with two instruments. First, the Parenting Stress Index (PSI; Abidin, 1995) was used to derive both parenting stress and parent-child dysfunction. The PSI consists of 23 items with a five point response scale that ranges from “strongly agree” to “strongly disagree”. Two subscales, Parenting Distress ($\alpha = 0.823$) and Parent-Child Dysfunction ($\alpha = 0.819$) were used in the analysis. Second, the Coping with Children’s Negative Emotions Scale (CCNES, Fabes et al, 2002) was used to assess parents’ self-reported reactions to negative child affect in distressing situations. Respondents are asked to indicate on a 7-point Likert scale ranging from “very unlikely” to “very likely” the likelihood of performing certain behaviors (e.g., “send my child to his/her room to cool off” or “tell my child it’s OK to cry”) in response to nine stressful situations for their children. The situational prompts and specific language used to describe parenting responses was significantly adapted by our team for use in this cultural setting. For analysis, we combined five of the

subscales into positive and negative domains. The distress and punitive reactions subscales were summed for the Negative Parenting domain ($\alpha = 0.667$), and the emotion focused, problem focused, and expressive encouragement subscales were combined for the Positive Parenting domain ($\alpha = 0.792$).

Child assessment

The child psychological characteristics employed as child outcomes in the current analysis were obtained via maternal report. Children's *adaptive functioning* was assessed via the Vineland Adaptive Behavior Scales (Sparrow, 2005), an interview-derived assessment of parent-perceived child functioning. Respondents are asked to rate child's functioning on a 3-point scale across four domains: Communication (receptive, expressive, written), Daily Living Skills (personal, domestic, community), Socialization (interpersonal relationships, play and leisure time, coping skills), and Motor Skills. We included the subscales reflecting the child's communication, daily living, and socialization skills in the current analysis, as these are theoretically linked in the model. Children's *internalizing* and *externalizing behavior* was assessed via the Child Behavior Checklist (CBCL; Achenbach 1991). The CBCL is a parent-report measure of children's behavior. For this data collection, respondents rated child behavior across 90 items utilizing a 3 point scale ranging from "not true" to "often true". The CBCL internalizing ($\alpha = 0.852$) and externalizing ($\alpha = 0.915$) subscales were used in the current analysis.

Data Analyses

In order to examine the role of maternal psychological variables on parenting and the role of parenting stress and style on child psychosocial outcomes, the data were analyzed using path analysis in Mplus Version 4.21. Path analysis simultaneously estimates multiple regression equations to examine dependencies among variables. Our path model was estimated using maximum likelihood methods and its fit was evaluated using three goodness-of-fit indices: 1) the chi-square statistic, 2) the root mean square error of approximation (RMSEA), and 3) the comparative fit index (CFI). Because these indices can be slightly inconsistent, it has been recommended that multiple fit indices be used in model evaluation (Jaccard and Wan 1996). The chi-square statistic suggests how well the proposed model fits the data. Non-significant values suggest adequate fit. Secondly, the use of RMSEA is highly recommended (Hu and Betler, 1999) and evaluates the poorness of fit. Lower scores, therefore, reflect better fit, with values ranging from 0 to 1 (with 0 suggesting perfect fit). The 90% confidence interval of the RMSEA should be below 0.08. Thirdly, the CFI measures goodness of fit with values above 0.9 indicating adequate model fit.

Our model was constructed and modified in the following manner. First, all maternal psychological and socio-demographic variables were used to predict each parenting variable, which were then used to predict child outcomes as shown in Figure 2 (below, in Results). Additionally, correlations between predictors and mediators were modeled. We then tested the addition of direct paths by examining modification indices. We added only direct effects that made conceptual sense and were relevant to our question of interest. R-square values were also calculated to suggest the amount of variance explained for each mediating and outcome variable.

Results

Participants

The mothers and their children spoke one of five study languages: Sepedi (70.8%), Isizulu (16.4%), Setswana (10%), Sesotho (1.7%) or English (1.1%), . The mean age of participating mothers was 33.1 years (range 22 to 52 years), most of whom (70.4%) were living with a partner. Their children, on average, were 8.2 years of age. Most of the women had less than 12 years of schooling (67.8%) and were unemployed (72.6%). [see Table I for full description of participant characteristics].

Model Fit

According to the goodness of fit indices, our initial model demonstrated adequate fit ($X^2(51) = 88.173, p < 0.01$; RMSEA=0.045 RMSEA 90% CI=0.029-0.060; CFI=0.970). The addition of selected direct paths, however, greatly improved the model fit ($X^2(43)=43.698, p=0.4417$; RMSEA=0.007, RMSEA 90% CI=0.000-0.036; CFI=0.999). Given the indications for best model fit described above, these results indicate an excellent fit of the data in the final model.

Maternal Psychological Variables and Parenting

Maternal Psychological Variables as Related to Parenting Stress and Parent-Child Dysfunction

The final path model explained 30.4% of the variance in parenting stress and 17.6% of the variance in parent-child dysfunction. Both parenting stress and parent-child dysfunction

Table I: Demographic Characteristics of Participants (N=361)

	Overall Mean \pm SD	Range
Maternal age	33.12 \pm 6.001	22 – 52
Child age	8.23 \pm 1.348	6 – 10
Total people in home	5.32 \pm 2.798	1 – 22
Education level		
12 years or more	116 (32.2%)	
Less than 12 years	244 (67.8%)	
Employment status		
Employed	99 (27.4%)	
Unemployed	262 (72.6%)	
SES	3.59 \pm 1.666	0 – 5
Partner		
Yes	254 (70.4%)	
No	107 (29.6%)	
If going to include staying with someone else etc should this not be here.		

were positively associated with higher maternal depression ($\beta=0.15$, $p<0.01$ and $\beta=0.09$, $p<0.05$; respectively) and with mothers' higher use of negative religious coping ($\beta=0.33$ and $\beta=0.28$, respectively; $p<0.01$) (See figure 1). In addition, parenting stress was increased in mothers who reported higher use of avoidant coping ($\beta=0.47$, $p<0.01$), but parent-child dysfunction was decreased with mothers' use of active coping ($\beta=-0.25$, $p<0.01$). Further, parenting stress was higher in mothers with lower socioeconomic status ($\beta=-0.73$; $p<0.01$).

Maternal Psychological Variables as Related to Parenting Style

The final path model explained 10.7% of negative parenting style and 6.5% of positive parenting style. Maternal coping emerged as the only significant predictor of parenting style. Mothers' higher use of active coping was associated with a more positive parenting style ($\beta=0.35$, $p<0.05$). Negative religious coping was associated with both negative and positive parenting styles ($\beta=0.47$; and $\beta=0.47$, respectively; both $p<0.01$).

Maternal Illness as Related to Parenting

HIV illness was associated with greater parent-child dysfunction ($\beta=1.86$, $p<0.05$) and greater parenting stress ($\beta=2.10$, $p<0.05$), but illness was not associated with either positive or negative parenting style.

Maternal Parenting and Child Behavioral Outcomes

Our final path model explained approximately 25% of the variance in each of the CBCL subdomains (internalizing behaviors [22.9%] and externalizing behaviors [26.8%]).

Additionally, our final model explained 12-19% of the variance in the three standardized scores derived from the Vineland (subscales Socialization [11.9%]; Daily Living Skills [13.7%]; Communication [18.5%]).

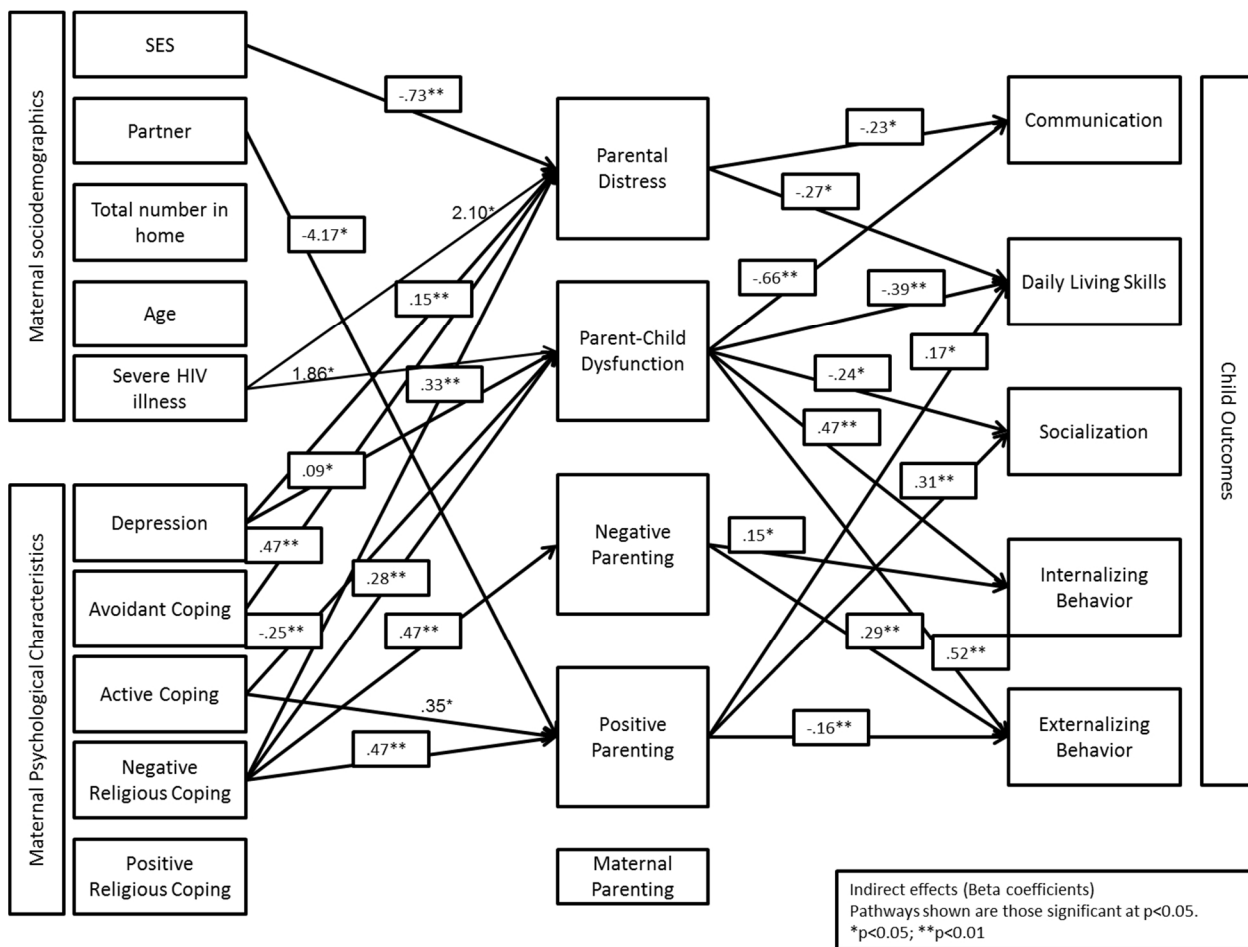
Parenting Stress and Parent-Child Dysfunction as Related to Child Psychosocial Outcomes

Higher parent-child dysfunction was related to higher scores in both internalizing and externalizing behaviors ($\beta=0.47$ and $\beta=0.52$, respectively; $p<0.01$) as well as to lower scores across all three adaptive functioning subscales utilized in these analyses: Socialization, Daily Living Skills, and Communication ($\beta=-0.24$, $p<0.05$; $\beta=-0.39$, $p<0.01$; and $\beta=-0.66$, $p<0.01$; respectively). Higher parenting stress was associated with lower Daily Living Skills and Communication scores ($\beta=-0.27$ and $\beta=-0.23$, respectively, $p<0.05$), but was not associated with internalizing or externalizing behaviors nor with child socialization.

Parenting Style as Related to Child Psychosocial Outcomes

Mothers' use of a negative parenting style was associated with higher children's internalizing and externalizing behavior scores ($\beta=0.15$, $p<0.05$ and $\beta=0.29$, $p<0.01$; respectively), but was not related to children's adaptive functioning. Higher use of a positive parenting style was associated with lower externalizing behaviors ($\beta=-0.16$, $p<0.01$), higher socialization ($\beta=0.31$, $p<0.01$), and higher daily living skills ($\beta=0.17$, $p<0.05$), but did not predict internalizing behaviors ($\beta=-0.06$, $p=0.088$).

FIGURE 1: Full Model: Relationships between Maternal Psychological Characteristics, Parenting, and Child Psychosocial Outcomes



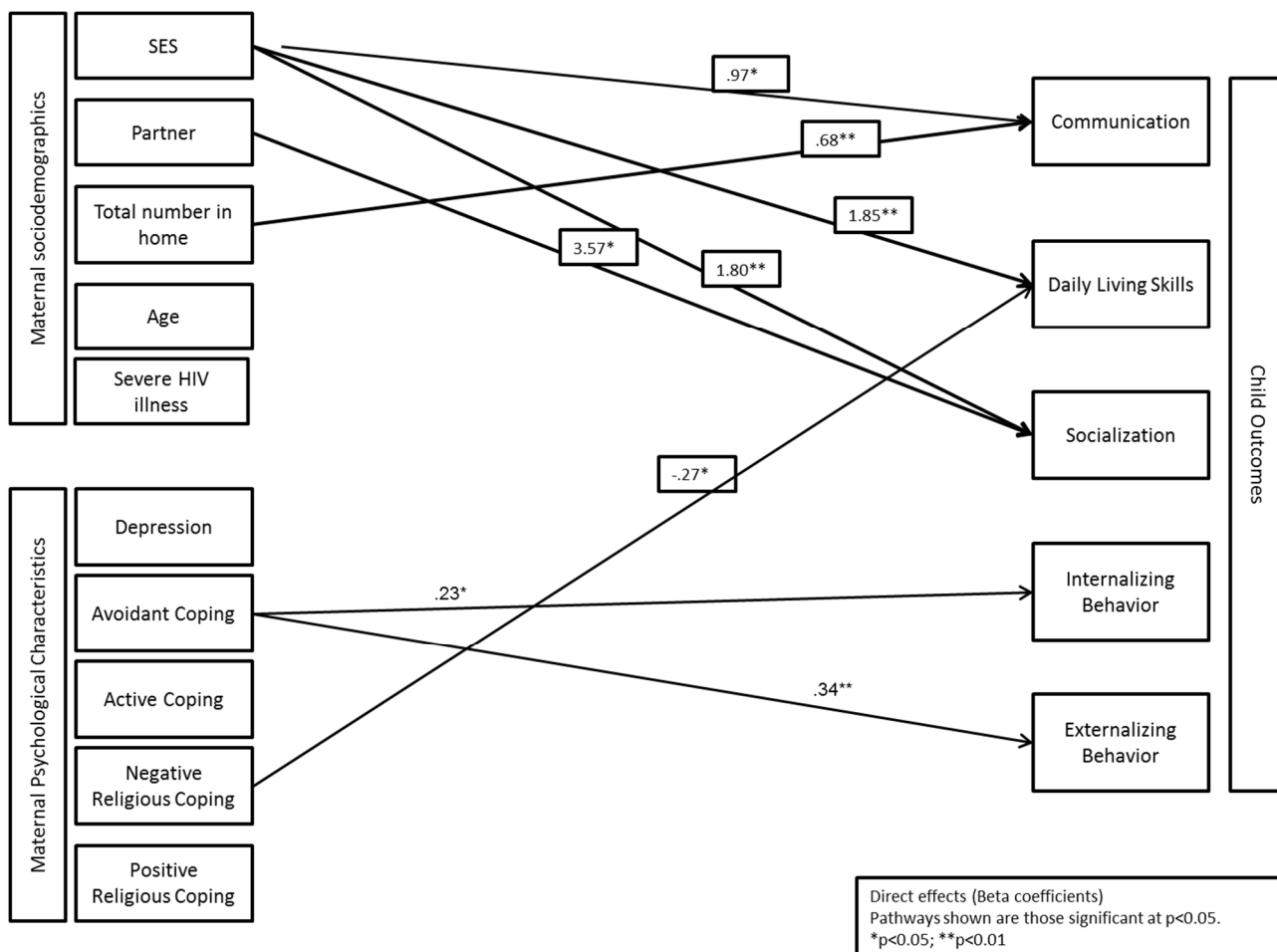
Direct Paths

Structural Factors Related to Child Psychosocial Outcomes

Informative direct paths include those between maternal sociodemographic variables and child adaptive functioning. Socioeconomic status demonstrated statistically significant direct positive effects on all three subdomains of the Vineland: socialization ($\beta=1.80$, $p < 0.01$), daily living skills ($\beta=1.85$, $p < 0.01$), and communication ($\beta=0.97$, $p < 0.05$). Additionally, the mother having a partner was strongly associated with higher child socialization scores ($\beta=3.57$; $p < 0.05$)

and a greater number of people in the home was associated with better child communication scores ($\beta=0.68$; $p<0.01$).

FIGURE 2: Direct Effects of Maternal Psychological Characteristics and Sociodemographic Characteristics upon Child Psychosocial Outcomes



Maternal Coping as Related to Child Psychosocial Outcomes

Regarding maternal psychological characteristics, only avoidant coping and negative religious coping directly contributed to child psychosocial outcomes. Mothers' higher use of avoidant coping was associated with children's higher internalizing and externalizing behaviors ($\beta=0.23$, $p<0.05$; and $\beta=0.34$, $p<0.01$; respectively), but was not directly related to adaptive

functioning. Negative religious coping was inversely associated with daily living skills ($\beta=-0.27$; $p<0.05$), but was not related to other indices of adaptive functioning nor to internalizing or externalizing behaviors. Figure 2 depicts direct effects of maternal psychological characteristics and sociodemographic characteristics upon child psychological outcomes. In Table II the direct, indirect and total effects for maternal sociodemographic and psychological characteristics on child functioning are presented.

Discussion

This study examined the strength of predictive pathways within a theoretical model that our team developed to guide the content and delivery of a group-based resiliency building intervention for young, uninfected children of women living with HIV in South Africa. Tested by path analysis, the overall model was deemed to be an excellent fit for the data. Specifically, we investigated the relationships between maternal psychological functioning, parenting, and child psychosocial outcomes, with parenting emerging as playing a primary mediating role. The model also included maternal illness severity and structural factors, such as socioeconomic status, maternal partner status, and number of people living in the home with the child.

In line with our hypotheses, child adaptive functioning and behavioral outcomes were associated with maternal depression through the mediating pathways of parenting stress and parent-child dysfunction. Mothers who reported higher levels of parenting stress also reported that their children showed lower adaptive functioning in communication and daily living skills. Interestingly, parenting stress was not associated with child externalizing or internalizing behavioral outcomes in this sample. Parent-child dysfunction emerged as a critically important

Table II: Direct, Indirect, and Total Effects for Maternal Sociodemographic and Psychological Characteristics on Child Psychosocial outcomes

	Communication	Daily Living Skills	Socialization	Internalizing Behavior	Externalizing Behavior
SES					
Total Effects	1.351 (0.513)**	2.179 (0.556)**	2.033 (0.504)**	-0.246 (0.147)	-0.273 (0.168)
Direct Effect	0.972 (0.480)*	1.85 (0.540)**	1.798 (0.483)**	---	---
Total Indirect Effects	0.379 (0.206)	0.328 (0.177)	0.235 (0.175)	-0.246 (0.147)	-0.273 (0.168)
Partner					
Total Effects	-0.196 (0.762)	-0.472 (0.657)	2.528 (1.651)	-0.086 (0.540)	0.158 (0.619)
Direct Effect	---	---	3.572 (1.550)*	---	---
Total Indirect Effects	-0.196 (0.762)	-0.472 (0.657)	-1.044 (0.652)	-0.086 (0.540)	0.158 (0.619)
Total number in home					
Total Effects	0.553 (0.261)*	-0.048 (0.101)	-0.049 (0.101)	0.117 (0.086)	0.158 (0.099)
Direct Effect	0.676 (0.234)**	---	---	---	---
Total Indirect Effects	-0.123 (0.121)	-0.048 (0.101)	-0.049 (0.101)	0.117 (0.086)	0.158 (0.099)
Age					
Total Effects	0.003 (0.057)	-0.017 (0.048)	-0.055 (0.048)	-0.011 (0.041)	0.005 (0.047)
Direct Effect	---	---	---	---	---
Total Indirect Effects	0.003 (0.057)	-0.017 (0.048)	-0.055 (0.048)	-0.011 (0.041)	0.005 (0.047)
HIV illness severity					
Total Effects	-1.767 (0.705)*	-1.326 (0.598)*	-0.817 (0.593)	1.161 (0.502)*	1.222 (0.577)*
Direct Effect	---	---	---	---	---
Total Indirect Effects	-1.767 (0.705)*	-1.326 (0.598)*	-0.817 (0.593)	1.161 (0.502)*	1.222 (0.577)*
Depression					
Total Effects	-0.092 (0.037)*	-0.084 (0.032)*	-0.045 (0.032)	0.047 (0.026)	0.037 (0.029)
Direct Effect	---	---	---	---	---
Total Indirect Effects	-0.092 (0.037)*	-0.084 (0.032)*	-0.045 (0.032)	0.047 (0.026)	0.037 (0.029)
Avoidant coping					
Total Effects	-0.215 (0.083)**	-0.158 (0.076)*	-0.061 (0.074)	0.385 (0.113)**	0.484 (0.118)**
Direct Effect	---	---	---	0.233 (0.109)*	0.336 (0.110)**
Total Indirect Effects	-0.215 (0.083)**	-0.158 (0.076)*	-0.061 (0.074)	0.152 (0.059)*	0.148 (0.067)*
Active coping					
Total Effects	0.231 (0.066)**	0.197 (0.059)**	0.177 (0.058)**	-0.137 (0.046)**	-0.163 (0.053)**
Direct Effect	---	---	---	---	---
Total Indirect Effects	0.231 (0.066)**	0.197 (0.059)**	0.177 (0.058)**	-0.137 (0.046)**	-0.163 (0.053)**
Negative religious coping					
Total Effects	-0.233 (0.076)**	-0.365 (0.138)**	0.008 (0.069)	0.212 (0.053)**	0.228 (0.060)**
Direct Effect	---	-0.270 (0.138)*	---	---	---
Total Indirect Effects	-0.233 (0.076)**	-0.095 (0.073)	0.008 (0.069)	0.212 (0.053)**	0.228 (0.060)**
Positive religious coping					
Total Effects	0.111 (0.096)	0.082 (0.079)	0.034 (0.079)	-0.069 (0.069)	-0.062 (0.079)
Direct Effect	---	---	---	---	---
Total Indirect Effects	0.111 (0.096)	0.082 (0.079)	0.034 (0.079)	-0.069 (0.069)	-0.062 (0.079)
R-Square	0.185	0.137	0.119	0.229	0.268

*p<0.05, **p<0.01

pathway between maternal depression and child psychosocial functioning. A higher level of dysfunction (as reported by the mothers) in the parent-child relationship predicted worse child psychosocial functioning across all outcomes: internalizing and externalizing behaviors as well as all three domains of adaptive functioning (socialization, daily living skills, and communication). These findings contribute to the growing literature on impact of maternal HIV and depression upon relationships within the family. In a study of 135 mothers with symptomatic HIV and young children aged 6 to 11 years, maternal depression was elevated and associated with less family cohesion and poor family sociability (Murphy et al., 2002). Other findings suggest that maternal psychiatric distress is associated with mothers' greater difficulty in caring for children (Silver, Bauman, Camacho, & Hudis, 2003) and higher levels of child responsibility for household tasks typically performed by the mothers (Murphy et al., 2002), which could be contributing to increased symptomatology (particularly internalizing symptoms of depression and anxiety) and decreased adaptive functioning of the children as children may be expected to fulfill family roles and tasks that are developmentally non-normative.

Contrary to our hypothesis, parenting style was not related to maternal depression. However, parenting style was related to child outcomes in conceptually important ways. Mothers who endorsed a negative parenting style also reported higher levels of internalizing and externalizing behaviors in their children. Interpreting these findings, it may be that a negative parenting style is not effective and similar to ineffective strategies used by depressed mothers (as reported in the Hoffman, Crnic, and Baker study [2006]), leading to increased child behavioral symptomatology. However, as these data are based fully upon maternal report, it may also be that mothers with a negative parenting orientation tend to engender more negative interpretations of their children's behavior (a phenomenon associated with depressed mothers reported by Dix

and Meunier [2009]), thereby inflating child symptomatology. Interestingly, though, these mothers did not report lower adaptive functioning in their children. In comparison, mothers who endorsed a positive parenting orientation reported lower externalizing behaviors in their children and higher adaptive functioning scores in socialization and daily living skills. Whereas a negative parenting style was found only to be related to child behavioral outcomes, a positive parenting style was related to aspects of both behavior and adaptive functioning. This indicates that positive parenting strategies may have more of a protective effect in encouraging improved behavioral outcomes than negative parenting strategies have on promoting detrimental child functioning.

Mothers' coping behaviors emerged as highly important in understanding parenting styles in the model analysis. Mothers' use of active coping was associated with a greater use of a positive parenting style and was likewise related to lower parent-child dysfunction. Alternatively, mothers who reported greater use of avoidant coping also reported higher levels of parenting stress, suggesting that avoidant coping techniques, while possibly efficacious in certain circumstances, may not be effective at mitigating parenting stress for women in this cohort. Furthermore, negative religious coping surfaced in the analysis as a robust predictor of parenting; it was associated with higher parenting stress and higher parent-child dysfunction, as well as negative and positive parenting styles. Culturally, religious belief and experience is highly valued in South African populations such as the one sampled for this study. It may be that women who are feeling isolated from their religious beliefs and/or a relationship with higher power, perhaps due to structural stressors or internalized stigma associated with HIV (see Wingood et al., 2008 re. stigma and mental health of women in South Africa), are more likely to feel disempowered and disenfranchised, hence experiencing greater stress and dysfunction in

their relationships with their children. A finding that was contrary to our hypothesis was that negative religious coping was associated with a more positive parenting style as well a more negative parenting style. This may suggest that the mothers attempt to alleviate their stress by “trying everything” with parenting.

Maternal coping was also directly related to certain child psychosocial outcomes, but only by negative coping indices. Mothers’ increased use of avoidant coping strategies was associated with higher internalizing and externalizing behavioral symptoms in their children and negative religious coping predicted lower daily living skills. Mothers who used more active coping strategies reported lower parent-child dysfunction. Maternal use of positive coping was thus related indirectly through lower parent-child dysfunction to improved indices across all child outcomes. These findings indicate that children may feel less secure and, in turn, more anxious, depressed, and oppositional when their mothers evidence difficulty in approaching stressful circumstances. Alternatively, mothers who engage stressors with positive responses may be interpreting their children’s behavior more favorably. They may also be modeling adaptive behavior for their children with resulting improved child functioning.

Certain structural variables were found to be directly related to children’s behavioral outcomes and adaptive functioning in our sample. Higher socioeconomic status, as reported by the mother, was associated directly with higher adaptive functioning scores in children across all three domains (socialization, daily living, and communication). Children who lived with more people in the home had better communication scores and children whose mothers were partnered had higher socialization scores. Our findings indicate that children may benefit in specific ways from interaction with more people in the home environment. Additionally, a higher socioeconomic status likely alleviates some strain on the mother and provides certain

environmental affordances, which may filter to an improved developmental environment (and hence, improved adaptive functioning) for her children.

Our findings from this sample indicate that illness plays a role in parenting behaviors and perceived stress, but may not influence a mother's overall parenting orientation toward positive or negative strategies. Furthermore, it is not directly related to child psychosocial outcomes (behavior or adaptive functioning), but is indirectly related to child outcomes via parenting. A prospective study of children's resiliency in the context of maternal HIV/AIDS found that child resiliency decreased as maternal viral load increased (Murphy & Marelich, 2008). However, this is not a clear-cut association and merits further investigation, as other studies have found limited associations between children's behavioral problems and maternal physical health (e.g., Bauman et al., 2002). It may be that the mother's approach to managing her illness and her illness-related coping behaviors are more impactful than objective illness indicators in influencing children's behavior and adaptive functioning.

Overall, the model illustrates the important mediating effects of parenting. Maternal depression, avoidant coping and poor religious coping have an adverse effect on parenting, while active coping predicts positive parenting and lower levels of dysfunction in the mother-child relationship. Within the model, parent-child dysfunction emerged as a robust predictor; while parenting stress was associated only with adaptive functioning (and not with child behavioral outcomes), parent-child dysfunction was associated with all child behavioral and adaptive functioning outcomes. This is a powerful finding that suggests it is the *relationship* between a mother and her child that is most important in promoting psychosocial health and resiliency in the child.

The impact of the HIV/AIDS epidemic in sub-Saharan Africa extends to the psychological and social development of the region's children. Relatively little is known about the psychosocial impact of maternal HIV upon African children, and there is sobering potential for the unfolding of psychological effects of HIV related trauma. Along with providing life-saving medical treatment comes the responsibility to attend to the psychosocial needs of the growing population of children affected by maternal HIV/AIDS in South Africa. Priorities for research have been identified in the literature, including the development and evaluation of maternal-child psychosocial interventions which can be implemented by community care workers (Brandt, 2009), thereby increasing sustainability and dissemination. Additionally, there has been a call in the literature for family-based psychosocial interventions targeting parenting and parent-child relationships (Mellins et al., 2008, Murphy et al., 2010). The current research responds to the ethical urgency of psychosocial intervention with children who are facing associated stressors of maternal HIV/AIDS to facilitate healthier outcomes.

Limitations

The interpretation and application of the study findings are best conducted within the context of several study limitations. Issues regarding measurement of psychological and behavioral functioning are often present in investigations in lower resourced settings (Ebersöhn & Ferreira, 2011) with fewer options of locally developed empirically validated assessment tools. Our team utilized Western derived instruments in the current assessment, which may introduce cultural bias given the subjectivity of cultural influence regarding certain aspects of psychological functioning. However, there is a paucity of empirically validated measures tapping these constructs specific to the culture within which we are working. We thus chose the assessment

battery based upon data from prior research investigations indicating these measures as psychometrically sound and “gold standards” in the evaluation of the constructs we were assessing. To address this limitation, the measurement battery underwent an extensive process of cultural review. Along with forward and back translation by independently contracted translators, a team of cultural advisors reviewed every item on each assessment instrument for applicability and sensitivity. Given changes that were made to the instruments as a result of this review, we investigated the psychometric properties of the instruments in use with the current population and found the internal validity to be sound across all measures used in this analysis.

Longitudinal data would further elucidate our findings regarding the relationships between maternal psychological and physical health, parenting, and child behavior and functioning. As this analysis utilized a cross-sectional design, conclusions cannot be drawn regarding causality. Furthermore, this analysis employed only parent-report measures, which is a limitation particularly in the interpretation of children’s internalizing symptoms (e.g., anxiety and depression). Children’s self-report measures evidence better validity for internalizing symptoms, parent-reported data is typically more valid for externalizing symptoms; thus, multi-informant (both parent and child) is the best choice for aggregating the data.

Conclusions

With expansion of the AIDS epidemic there is a continuing need to decrease the potential adverse effects on the children whose parents are living with HIV. Concomitantly, improving women’s health outcomes contributes to their capacity for positive, productive parenting. It is critical to modify and evaluate psychosocial interventions in low resource, high-prevalence

settings given the specific demands and constraints associated with this context (Chandan & Richter, 2009). The results of this study suggest that interventions designed to promote resilience among these children should not only address maternal psychological functioning (depression and coping), but should also focus on parenting, avoiding negative parenting and promoting a positive approach.

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