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Stress processes in HIV-positive African American mothers: Moderating effects of drug abuse history

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Abstract

This study examined the mechanism by which stressors, dissatisfaction with family, perceived control, social support, and coping were related to psychological distress in a sample of HIV-positive African American mothers. Additional analyses explored whether women who had a history of a drug abuse or dependence diagnosis differed either on levels of the study variables or the model pathways. The results indicated that HIV-positive African American mothers who had higher levels of stressors perceived their stressors as a whole to be less controllable. Coping resources, available social support and perceived control, were positively associated with active coping and negatively associated with psychological distress. Avoidant coping was the most important predictor of psychological distress. Furthermore, the effect of avoidant coping on psychological distress was stronger for mothers with a history of drug diagnosis. The implications of these findings for targeting interventions are discussed.

Keywords

Drug abuse history; HIV/AIDS; African American women; stress process model

The HIV/AIDS epidemic represents a growing and persistent health threat to women, especially women of color. The Centers for Disease Control and Prevention (CDC&P, 2005) reported that AIDS was the 6th leading cause of death among all women aged 25 to 34 years and the 4th leading cause of death among all women aged 35 to 44 years. Additionally, the rate of AIDS diagnoses for African American women was approximately 25 times the rate for white women and 4 times the rate for Hispanic women. AIDS is now the leading cause of death for African American women aged 25 to 34 years and is among the four leading causes of death for African American women aged 20 to 24 and 35 to 44 years.

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Urban low-income African American women in addition to experiencing an increased risk of HIV infection are also subject to multiple minority status – black, female and low income (Carrington, 1980; Hauenstein, 1996; Warren, 1997). Thus, African American women's social position may heighten their vulnerability to distress. Because emotional distress is related to progression of HIV/AIDS (Cruess et al. 2000a,b), it is valuable to have an improved understanding of the stress mechanisms among HIV-positive African American mothers.

The Stress Process Framework

There has been substantial research conducted within the stress process framework, relating stress and psychological distress (see Folkman & Lazarus, 1988a,b; Lazarus & Folkman, 1984; Pearlin, Lieberman, Menaghan, & Mullan, 1981; Pearlin & Schooler, 1978; Cohen & Wills, 1985). The stress process framework assumes that a universe of intervening factors influence how an individual responds to or copes with stressful events. Some factors are coping resources that the individual may utilize to mitigate the negative effects of stress, thus protecting the individual from adverse consequences. Resources may include internal factors such as perceived control, and relational factors such as family functioning and social support. Other factors are coping responses, which may include active and support coping. Potentially detrimental responses may include avoidant coping (Dew et al., 1998; Fondacaro Rudolf, 1989; Nyamathi, Stein, & Brecht, 1995; Patterson et al., 1993). Finally, the effects of stress on psychological distress may be particularly relevant for individuals affected by both HIV/AIDS and substance abuse. For some women, a drug history renders them more vulnerable to new stressors; while for others, drug recovery may serve to inoculate them from new stressors. For example, the impact of an HIV/AIDS diagnosis on women with drug histories can be negative (e.g., a stressor that triggers relapse) or positive (e.g., a critical event that spurs the woman's resolve to stop using drugs once and for all). These factors may magnify both the incidence of stress as well as the reactivity to stress.

In the current study, we propose a stress process model with history of substance abuse diagnosis as a moderator of the relationship between stressors and psychological distress in HIV-positive African American mothers. This model is presented in Figure 1 and the forthcoming literature review will examine the constructs and pathways included in our stress process model.

Stressors and Strains

The sources of stress or stressors can be divided into three subcategories: major life events, chronic strains, and daily hassles (Pearlin & Lennon, 1989; Thoits, 1995). To qualify as a stressor, these life events, conditions (in the case of strains), and daily interactions/behaviors (in the case of hassles) must be appraised as a threat, challenge, or potential harm (Lazarus & Folkman, 1984) that distinguishes them from the normal consequence of social life and its various developmental stages (Pearlin et al., 1981). These three overlapping subcategories of stress differ in magnitude/severity (major life events versus chronic strains or hassles) and/or chronicity (strains versus hassles and some life events) and do have unique contributions to make to the domain of stressor (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Dixon, Rumford, Heppner, & Lips, 1992). Measures of stress frequently assess both the occurrence of events or existence of conditions as well as an intensity or impact rating. The use of only the occurrence measure avoids the possibility of confounding with psychological distress (the ultimate reaction to the stressful event or condition) as has been an ongoing concern in the literature (Dohrenwend, Dohrenwend, Dodson, & Shrout, 1984; Lazarus, DeLongis, Folkman, & Gruen, 1985; Lazarus, 1990). We hypothesize that stressors will have a direct negative effect on perceived control and social support, and a positive effect on family dissatisfaction (Pathway A in Figure 1). Stressors will have a direct negative effect on active coping and support coping,

and a positive effect on avoidant coping (Pathway B in Figure 1). Stressors will have a direct positive effect on psychological distress (Pathway C in Figure 1).

Coping Resources – Family, Social Support and Perceived Control

Resources such as family, social support, and perceived control are considered to have positive effects on psychosocial outcomes (Feaster & Szapocznik, 2002). Resources are dispositions and beliefs (perceived control) or individuals and groups on which individuals can draw for help. The family plays an important role in the lives of African Americans and has served as a critically important source of emotional support and refuge (Benin & Keith, 1995; Boyd-Franklin, 1989; Greenwood et al., 1996; Neighbors, 1997; Smith et al., 2001; Taylor, Chatters, & Jackson, 1997) for African Americans who have historically faced slavery, racism, discrimination, and harsh economic conditions. The dimensions of family satisfaction and dissatisfaction with family appear to be particularly important because of the increased likelihood that women with HIV are isolated from important sources of familial support, and relationships within the family may be disruptive and non-supportive (Amaro, 1990; Minkoff & DeHovitz, 1991; Jekins & Coons, 1996).

Social support is another important resource that refers to one's social bonds, social integration, and primary group relations (Turner, 1999). Social support is an external coping resource (Wheaton, 1985; Thoits, 1995) that is multidimensional and can involve perceived, structural, and received support (Turner, 1999). Social support may include supportive interactions (Turner, 1981) and "instrumental, informational and/or emotional assistance" (Thoits, 1995). Measures of social support that enumerate a person's social network have been found to have direct and mediating effects on psychological distress, whereas perceived availability of support has tended to produce stress-buffering relationships (Cohen & Wills, 1985; Thoits, 1995).

Perceived control over stressors, which is related to and likely influenced by *mastery* (Pearlin et al., 1981), is an internal coping resource. Perceived control is more stressor specific than Pearlin's mastery which has been used as a more trait-like construct. The level of stressors an individual experiences has been shown to be related to perceived control (Brosschot et al., 1998). Thus perceived control is determined both by the objective characteristic of a stressor and a person's perception, the latter of which may be influenced by the number of stressors experienced. The extent that stressors are perceived to be controllable may lessen the likelihood that the stressors lead to psychological distress. In addition, the individual's perception of their stressors as controllable is likely to influence their choice of coping responses to the stressors (Folkman, 1984). We hypothesize that social support and perceived control will have a positive effect on active coping and support coping and a negative effect on avoidant coping (Pathway D in Figure 1). Family dissatisfaction will have a negative effect on active coping and support coping and a positive effect on avoidant coping (Pathway D in Figure 1). Social support and perceived control will have a negative effect on psychological distress (Pathway E in Figure 1). Family dissatisfaction will have a direct positive effect on psychological distress (Pathway E in Figure 1).

Coping Responses

Coping responses refer to the actions or cognitions that an individual employs to manage stressful events, including active coping (i.e. facing the problem directly), avoidant coping (i.e. attempting to ignore the problem), and support coping (i.e. seeking help from others in addressing the problem). Coping-focused stress process models assume that when confronted with stressors, individuals consider their coping resources and then make a decision as to which coping responses to employ. Coping responses are important determinants of psychological distress generally (Lazarus & Folkman, 1984; Holahan & Moos, 1986), as well as specifically

for psychological adjustment in HIV-positive persons (Namir, Alumbaugh, Fawzy, & Wolcott, 1987; Kurdek & Siesky, 1990). We hypothesize that active coping and support coping will have a direct negative effect on psychological distress (Pathway F in Figure 1). Avoidant coping will have a direct positive effect on psychological distress (Pathway F in Figure 1).

Mediating Relationships

The hypothesized direct effects imply a sequence of mediated relationships. First, the effect of stressor occurrence on psychological distress is mediated by both coping resources (social support, perceived control and family dissatisfaction) and coping responses (active, support and avoidant). Further, the effect of coping resources on psychological distress is mediated by coping responses.

Contextual Factor: History of Drug Abuse and Dependence

In addition to psychological distress, exposure to stress has been linked to the use of alcohol and psychoactive substances, including patterns of use that are indicative of abuse or dependence (Aneshensel, 1999). Much of the literature with substance use and the stress process model has traditionally explored substance use as a means of coping with stress (see Aneshensel, 1999; Rhoads, 1983 for a range of papers). There is some evidence that drug use is related to increased stress and psychological distress. For example, Kelley (1998) found that substance-abusing mothers scored significantly higher than comparison mothers on total stress. In addition, Brunswick, Lewis, and Messeri (1992) found that moderate drug use (at least weekly but less than daily use of at least one illicit substance) and heavy drug use (daily use of at least one illicit substance) were positively related to psychological distress. In another study, among those having a diagnosis of abuse or dependence on non-alcoholic substances, drug use was associated with higher family stress, lower family satisfaction, and less communication and family resources (Iraurgi-Castillo, Sanz-Vazquez, & Martinez-Pampliega, 2004).

In addition to these potential differences in mean levels of stress process variables as a function of drug use diagnosis, there may be differences in the strength of association amongst variables in the stress process. Understanding these differences in the stress process in women with a history of drug abuse or dependence is important for any group wishing to intervene in the stress process of this population. Whereas comparisons of the stress process of individuals with and without drug-use histories are not common, there is significant research documenting interactions in psychosocial functioning predicting drug use. For example, Bobadilla & Taylor (2007) found that physiological reactivity to a noise stressor was related to alcohol and cannabis abuse symptoms only among participants with a low ability to cope. Buckner, Schmidt, Bobadilla, and Taylor (2006) found that social anxiety predicted cannabis abuse only when perceived coping was low. Studies have also shown genetic effects on serotonin-related processes that in turn affect both behavior and likelihood of addiction (Feinn, Nellissery, & Kranzler, 2005; Handelsman et al., 1998; Lesch & Merschedorf, 2000; Mannelli et al., 2006; Patkar et al., 2002; Taylor & Stanton, 2007). If these various interactions predict the probability of developing drug abuse or dependence, then HIV-positive African American women who do not have any history of drug abuse or dependence will have different relationships amongst stress process variables than do HIV-positive African American women with a history of drug abuse and/or dependence.

For HIV-positive African American mothers with a history of substance abuse or dependence diagnosis, past use of drugs may be a marker for psychosocial vulnerabilities that in part contributed to the development of that diagnosis which implies that drug abuse history will moderate their stress processes. We therefore hypothesize that among HIV-positive African American mothers with a history of a drug abuse or dependence diagnosis, stressors and

avoidant coping responses will have a stronger positive relationship with psychological distress, and that coping resources, and active and support coping responses, will have an attenuated relationship to psychological distress relative to those HIV-positive African American mothers without a history of a drug abuse or dependence diagnosis (i.e. drug abuse or dependence diagnosis will moderate or change the relationships of stressors, dissatisfaction with family, perceived control, social support, coping, and psychological distress).

The Present Study

Whereas there has been substantial research on various aspects of the stress process, research on urban, low-income African American mothers with HIV infection has only relatively recently been initiated. These past research studies have investigated the stress process model and a host of psychosocial variables and processes including how the stress process of the recent HIV-positive African American mothers affected all of her family members (see Feaster & Szapocznik, 2002) and the role of religious involvement within a stress process framework among HIV-positive African American mothers (see Prado et al., 2004). The current study extends and builds on the prior research programs. Accordingly, the primary goal of this study is to examine a stress process model with history of substance abuse diagnosis as a moderator of the relationship between stressors and psychological distress in HIV-positive African American mothers.

Method

Participants

Participants in this study were 265 urban, low-income HIV-seropositive African American mothers. Data for the present analyses were taken from the assessment of a larger study testing the efficacy of Structural Ecosystems Therapy (Szapocznik et al., 2004) with HIV-seropositive African American mothers. Participants in the study were recruited from a large urban medical center and affiliated clinics, as well as from agencies that provide social services to HIV-seropositive individuals. An interviewer explained the study to each woman and obtained informed consent from her. The active phase of recruitment for this study extended from the fall of 1996 to the spring of 1999.

To be eligible for participation in the intervention study, women had to meet the following screening criteria: (a) African American; (b) HIV-seropositive, as determined by self-report; and (c) at least 18 years of age and have at least one other family member willing to participate in the study. Women were excluded from participation for the following reasons: (a) reporting problems with illicit drug use in the prior six months; (b) prior psychiatric hospitalization (with the exception of hospitalization for drug abuse); (c) CD4 cell count below 50 (to ensure completion of the parent study); or (d) cognitive impairment severe enough to preclude completion of the assessment battery. In addition to the foregoing inclusion/exclusion conditions: (a) all women had to have at least one child, although there were no limits on the ages of children and children did not have to live with the mother; and (b) women had to report at least two interpersonal problems, including one family-related problem on our Recruitment/Screening form. Interpersonal problems listed on the screening checklist included having too much stress, feeling sad or depressed, feeling anxious or nervous, and feeling lonely. Family problems listed on the screening checklist included fear of disclosing HIV status to family members, conflicts with family, communication problems with family, drug/alcohol problems in the family, child custody problems, child-related problems (e.g., school, behavior, health), and problems with one's romantic partner.

Women were recruited into the study on the basis of a brief screening and then assessed by a larger battery at baseline. After this assessment, another family assessment was scheduled

within a few weeks and prior to randomization (for the intervention study). At the time of this family assessment, the assessor completed a Structured Clinical Interview for DSM-III-R with the HIV-positive women. There were 206 women for whom DSM III-R alcohol and drug abuse/dependence information was completed. All data utilized in the current study were collected prior to randomization into the intervention study.

Assessments

All assessments were conducted at the woman's home or other location convenient to the woman (e.g., the home of a family member). For purposes of confidentiality and privacy, all efforts were made to conduct the assessments in a quiet room in the home. Interviewers administered the assessments and recorded participants' responses on laptop computers. Participants were paid \$50 for completing the main baseline assessment. The measures described in this article were part of a larger assessment battery administered to participants. Assessors were African American, Caribbean American or Hispanic females between the ages of 25 and 30. Assessors either had a master's degree in counseling psychology or social work or were enrolled in a psychology doctoral program.

After the main baseline assessment, another family assessment was scheduled within a few weeks and prior to randomization (for the intervention study). At the time of this family assessment, the assessor completed a Structured Clinical Interview for DSM-III-R (Spitzer, Williams, Gibbon, & First, 1989) with the HIV-positive women while family members completed a short battery. Women were paid \$20 for completing this second family assessment. There were 208 women for whom DSM III-R alcohol and drug abuse/dependence information was completed. All data utilized in the current study were collected prior to randomization into the intervention study.

Measures

Stressors—To measure life stressors, a composite score was created from three measures: (1) hassles; (2) difficult life circumstances; and (3) major life events. A description of each measure follows.

Hassles were measured by the Hassles Scale developed by DeLongis, Folkman, and Lazarus (1988). The instrument consisted of 64 items that assess daily hassles (e.g., family-related obligations; health of spouse or love one; enough money for necessities) that occurred during the past 30 days. Scores are generated for total count (i.e. total number of hassles) and intensity of hassles (i.e. on a scale from 1 = None to 4 = Great Deal). The total count of hassles rather than the intensity measure was used to avoid the potential for confounding with our outcome measure, psychological distress. Cronbach's alpha for the sample was .92.

Difficult Life Circumstances (DLC) were measured with the Difficult Life Circumstances Questionnaire (Barnard, 1989). This measure was selected because it is composed of stressors relevant to poor, inner city women. For each of the 34 stressors listed, the participant was asked to indicate (a) whether the stressor was present in her life (yes or no); and (b) the subjective impact of the stressor (on a scale of 1 = Extremely Negative to 7 = Extremely Positive). The midpoint for the scale was 4 = No Impact. Sample items include: (a) Do you need more money for necessities?; (b) Is one of your children being abused sexually, emotionally, or physically by anyone?; (c) Do you have a problem with alcohol or drugs (prescription or street)? To avoid confounding DLC with psychological distress, the total count of DLC, rather than the subjective impact, was used. Cronbach's alpha for the sample was .75.

Major life events were measured using a shortened version of the Life Event Scale (LES) (Sarason, Johnson, & Siegal, 1978). The LES items represent life changes frequently

experienced by individuals in the general population. In the present study an adaptation of this scale was used. The format of this Modified Life Events Scale called for respondents to separately rate the desirability and impact of life events experienced. The scale was based on the 10 most often endorsed items by an earlier pilot sample of 47 seropositive African American women and 61 seronegative African American women (Hinkle, 1991). The 10 items were major changes in work; major changes in eating habits; major changes in sleeping habits; outstanding personal achievement; death of a close family member; death of a close friend; pregnancy; gaining a new family member; change of residence; and a major change in church activities. The count of negatively appraised life events, rather than the impact scores (1 = Extremely Negative to 7 = Extremely Positive) were used to have a measure of events that were not confounded with our outcome variable, psychological distress. The sum of negatively appraised life events, [i.e. any items appraised as 1 (Extremely Negative) to 3 (Somewhat Negative)] was used as an observed measure.

Relatively high correlations (.37 to .56) among the measures (hassles, DLC, and major life events) indicated that although the scales were intended to measure separate constructs, an overall composite could be constructed. Due to differing scales, however, the scores from each scale were standardized before the composite was calculated so that they each contributed equally to the final composite. In this sample the overall alpha for this composite scale was .71.

Perceived Control of Life Stressors

Controllability of life stressors was measured using the Perceived Control Questionnaire (Hinkle & Antoni, 1991). The Perceived Control Questionnaire is a 12-item measure of the respondent's perceptions of personal control over certain life domains, such as health of the respondent and her children, source of money, and sexual behaviors. Answers are recorded on a 5-point Likert scale, ranging from "none" to "extreme or complete." Concurrent validity was established in a validation sample in which the correlation of the total Perceived Control Questionnaire and Pearlin's Mastery Scale (Pearlin et al., 1981) was .62 ($n = 44$). In the current study the scale obtained adequate reliability for the sample (Cronbach's alpha = .77).

Social Support Network Size

Social support network size was measured with the Social Support Questionnaire – Short Form (SSQ6) (Sarason, Sarason, Shearin, & Pierce, 1987). For each of the six items (e.g. Whom can you really count on to be dependable when you need help?), respondents indicate the number of people available to provide support. The current study used the total number of people listed as a measure of social support network size (Cronbach's alpha = .86).

Dissatisfaction with Family

Dissatisfaction with family was measured using a subscale of the Feetham Family Functioning Survey (FFFS) (Roberts & Feetham, 1982). The FFFS is a 29-item instrument used to measure the relationship between the participant, her family, and her larger ecosystem. The FFFS asks respondents to indicate on a 7-point Likert scale ranging from 1 = *Little* to 7 = *Much*, the amount of time they spend, the amount of time they would like to spend, and the perceived importance of spending time with their family, friends, health-care providers, and other parts of their ecosystem. In the present study, 12 of the spouse/partner and relatives' items (e.g. discussion with relatives, time spent with spouse/ partner, help from relatives, emotional support from spouse/partner) were summed to compute a composite family scale score. Dissatisfaction with family was measured using a gap score, which was calculated by summing the differences between desired interactions and actual interactions. Cronbach's alpha for the dissatisfaction with family scale in the current sample was .79.

Coping Responses

Coping responses were measured using the Brief Cope (Carver, 1997) plus 11 additional items developed for use with this population (see Feaster & Szapocznik, 2002). The Brief Cope generated three global constructs of coping, active, support, and avoidant coping scales. Similar composites have been used in research on HIV-seropositive persons (Blaney et al., 1997; Feaster et al., 2000; Feaster & Szapocznik, 2002; Goodkin et al., 1992; Prado et al., 2004). Active coping includes items measuring positive reframing, planning, and taking action. The reliability for the active coping construct in the present study was .72. Support coping included items measuring the use of emotional and instrumental support, talking with others, and use of therapy. The reliability for the support coping construct in the present study was .75. Avoidant coping included items measuring the use of suppression of thoughts, denial, self-blame, ventilation, stoicism, behavioral disengagement, self-distraction, and yearning for the past. The reliability for the avoidant coping construct in the present study was .84. The support coping and social support measures used in this study were distinct from one another, in that support coping refers to the use of or reliance on sources of support whereas social support refers to the size of the available support network. Items for this measure are rated on a 4-point Likert-type scale ranging from 1 = I have not been doing this at all to 4 = I have been doing this a lot.

Psychological Distress

Psychological distress was measured using the Brief Symptom Inventory (BSI; Derogatis, 1993). This 53-item questionnaire asks respondents to rate, on a 5-point Likert scale ranging from 0 = Not at all to 5 = Extremely, the extent to which specific items (e.g. feeling lonely, feeling very self-conscious with others, and feeling easily annoyed or irritated) have distressed them in the past week. In the present study Cronbach's alpha for this scale was .96

Structured Clinical Interview for DSM-III-R – Non-Patient Edition for HIV+

The SCID (Spitzer et al., 1989) was administered at baseline and used to characterize the population. The measure was used to assess lifetime and current alcohol and drug abuse or dependence. The SCID was administered and rated by raters trained by a SCID-qualified psychiatrist. Inter-rater reliability for this measure was adequate ($\kappa = .78$).

Analytic Plan

Path analytic structural equation modeling was used to test the influence of the following hypotheses (see Figure 1): (i) stressors will have a direct negative effect on perceived control, and social support and a positive effect on dissatisfaction with family (Pathway A); (ii) stressors will have a direct negative effect on active coping and support coping and a positive effect on avoidant coping (Pathway B); (iii) stressors will have a direct positive effect on psychological distress (Pathway C); (iv) social support and perceived control will have a positive effect on active coping and support coping and a negative effect on avoidant coping (Pathway D); (v) family dissatisfaction will have a negative effect on active coping and support coping and a positive effect on avoidant coping (Pathway D); (vi) social support and perceived control will have a negative effect on psychological distress (Pathway E); (vii) family dissatisfaction will have a direct positive effect on psychological distress (Pathway E); (viii) active coping and support coping will have a direct negative effect on psychological distress (Pathway F); (ix) avoidant coping will have a direct positive effect on psychological distress (Pathway F).

In addition to the paths described in Figure 1, the error terms for the path (regression) equations for the three coping responses were allowed to be inter-correlated. The error terms for the path (regression) equations for dissatisfaction with family and social support were also allowed to correlate due to the supportive nature of some of the items in the dissatisfaction measure. After

model fit was determined, individual coefficients estimated in this model were tested for significance using the maximum likelihood estimate of their standard error. These results were confirmed by examining confidence intervals for each parameter using bootstrapping methodology (Arbuckle, 1997). Bootstrapping is robust to possible error due to abnormal distributions within the data as well as a modest sample size. Bootstrapping uses the empirical distribution of the estimates obtained from a specified number (1000 here) of samples obtained from sampling from the sample (with replacement). The results of bootstrapping are dependent neither on distributional assumptions (such as normality) nor on the size of the sample (asymptotic assumptions). Because there were minute differences in results between the two methods, the maximum likelihood estimates are reported. When examining indirect and total effects, the bootstrapped *p*-values were used to assess statistical significance.

Please note that the model as described does not include any measurement modelling. The relatively modest sample size of this investigation does not support the use of measurement modelling for the number of constructs included. Thus, this is a path analytic structural equation model, wherein the structure that we have hypothesized for the paths is tested. We also, in post hoc sensitivity tests have decomposed the effects of stress into its constituent components (life events, hassles, and difficult life events) and explored the effect of using a measurement model for the global stressor construct.

Finally, the study tested whether women who had a history of a drug abuse or dependence diagnosis were different either on levels of the study variables or the model pathways. This was accomplished in two steps. First, *t*-tests were performed on each of the variables in the model to determine whether there were significant mean differences in levels of these variables (Table II). This was followed by the re-estimation of the model in Figure 1 as a multi-group comparison to examine whether there was an overall difference in the model between women who entered the study with a history of drug abuse or dependence diagnosis. This model multi-group SEM tested whether the entire model described above differed significantly by history of drug diagnosis. We then explored individual paths that may have differed in a planned post hoc exploration and examined differences in the indirect effects implied for the two groups.

Results

Demographic Information

The sample demographics are reported in Table I. The mean age for the mothers was 35.43, *SD* = 8.44. Half of the mothers had less than a high school education. The median family income level was \$9636. Most mothers in the sample received some form of public assistance (81.5%) and were unemployed at the time of the interview (78.1%). The mean number of children of the mothers was 1.94. Sixty-eight percent of the sample met a lifetime DSM-III-R diagnosis of alcohol and/or drug abuse or dependence [measured in this study by the Structured Clinical Interview for DSM-III-R (SCID), Non-Patient Version for HIV-seropositive person] at the time of the assessment (Spitzer et al., 1989). Comparing demographic characteristics by history of substance abuse diagnosis showed that the two groups were not significantly different on any of the demographic variables. Because the drug diagnosis information is only available on 206 of the women, we also compared means of all model variables and all demographic variables. Only level of control was significantly different ($p = .03$) with women in the sample of 206 having higher perceived control over stressors. Thus, one of the 17 variables in Tables I and II combined showed a significant difference.

The 143 women who had a history of alcohol/drug abuse/dependence diagnoses were generally involved with more than one drug. A total of 38 women (26.6%) had a diagnosis on one drug, only, whereas, 58 (40.6%), 30 (20.9%) and 17 (11.9%) had diagnoses on two, three and four or more drugs (including alcohol). Of these same 143 women, only 10 (7.0%) did not have at

least one diagnosis of dependence, and 103 (72.0%) had only dependence diagnoses. A total of 30 (21.0%) had both an abuse and dependence diagnosis. Because most women had diagnoses on multiple substances percentages of each drug add to more than 100%: 77.6% cocaine, 61.5% alcohol, 40.6% marijuana, 13.3% opiates, 11.2% polysubstance, 8.4% sedatives, 5.6% other, 4.9% amphetamines, and no diagnoses involving hallucinogens.

Model Findings

The model in Figure 1 fits the data adequately: $\chi^2(2) = 5.087$, $P = .08$, $CFI = .99$, $RMSEA = .076$. The results of bootstrapped confidence intervals always matched the results of the maximum likelihood estimates indicating that there was little bias from non-normality or the relatively small sample size.

The results of the model will be presented in terms of the regression equations represented in the paths. These are organized into the predictors of the resource variables, predictors of the three coping response variables and predictors of the final outcome, psychological distress (see Figure 2). Standardized path coefficients are presented.

Resources

Stressors were positively related to dissatisfaction with family ($\beta = .28$, $p < .0001$) and negatively related to perceived control ($\beta = -.17$, $p < .01$), indicating that more daily hassles, DLC, and major life events were associated with more dissatisfied interactions with family and less feelings in control of life domains. Stressors were not significantly related to social support.

Coping

Social Support was the only significant predictor of support coping ($\beta = .25$, $p < .0001$), indicating that more available supportive persons were associated with more utilization of support as a coping response. Social support was also negatively related to avoidant coping ($\beta = -.15$, $p < .01$), meaning that having more available supportive persons was less associated with the use of avoidant coping strategies such as disengagement, distraction, and suppression of thoughts. Stressors were positively related to avoidant coping ($\beta = .24$, $p < .0001$), indicating that having more stressors were associated with more use of avoidant coping strategies as a coping response. Finally, social support also predicted more active coping ($\beta = .12$, $p < .05$). This finding suggests that having more available supportive persons were associated with the use of positive reframing, planning, and taking action as a coping response.

Distress

In this model, stressors remained positively related to distress ($\beta = .33$, $p < .0001$) indicating that women who experienced more stressors had more symptoms of psychological distress and that the other model variables only partially explained the relationship between stressors and distress shown in the first model. Perceived control was the only resource variable that remained a significant predictor of distress in this larger model. Perceived control was negatively related to distress ($\beta = -.12$, $p < .01$), indicating that having more feelings of control were associated with less distressed, even when controlling for choice of coping responses. Finally, avoidant coping was strongly related to increased psychological distress ($\beta = .49$, $p < .001$) and active coping was related to decreased psychological distress ($\beta = -.11$, $p < .05$), indicating that women who used more avoidant coping such as disengagement, distraction and suppression of thoughts had more distress symptoms and those who used active coping like planning and taking action had less distress symptoms.

Mediating Relationships

The model as hypothesized implies that both coping resources (family dissatisfaction, social support and perceived control) and coping responses (active, avoidant and support coping) are potential mediators of the effect of stress on psychological distress. Further, the model implied that coping responses are potential mediators of effect of coping resources on psychological distress. These relationships can be examined by examining the significance level of indirect effects in the model.

Stress had a significant standardized indirect effect on psychological distress (measured as the sum of the products of each of the pathways from stress to psychological distress: $\Sigma(\Pi(\beta)) = .16, p < .0001$) implying that coping resources and responses jointly mediated the effect of stress on psychological distress. The largest contributor to this indirect effect was the influence of stress on psychological distress through avoidant coping ($-.28 \times .49 = .137$). Likewise, the significant standardized indirect effect of social support on psychological distress ($\Sigma(\Pi(\beta)) = -.16, p < .002$) provides some evidence for coping responses mediating the effect of coping resources (note that there was not a significant direct effect of social support on psychological distress). Specifically, social support had significant direct effects on all three forms of coping responses, and two of those three coping responses (active and avoidant) had significant effects on psychological distress. Whereas the effect was distributed across multiple coping responses, avoidant coping was the largest single contributor to this effect ($-.15 \times .49 = -.07$).

Post Hoc Analyses

We examined whether results from this model differed in anyway when stress was measured in different ways. First, we replaced the observed composite score with a latent construct for stressors with negative life events, difficult life circumstances and hassles as the three indicators of the latent stressor construct. Second, we decomposed the observed composite to examine whether relationships within the model differed when negative life events, hassles or DLC were used as the observed measure of stress. All four variations of the model showed the same results presented above.

Differences in Full Model by History of Drug Abuse or Dependence Diagnosis

We examined potential differences in the prior model by whether the women had a history of drug abuse or dependence diagnosis using a multiple-group path analysis. This information was only collected of women who met criteria for a subsequent intervention study (Szapocznik et al., 2004), and is therefore only available for 206 women. First, we examined mean differences of each of the variables within the model. As can be seen in Table II, women with a history of drug abuse/dependence had significantly higher levels of support coping ($t(204) = 3.57, p = .001$), lower levels of perceived control ($t(204) = 2.28, p = .02$), and higher levels of social support ($t(204) = 2.05, p < .05$).

Overall, the model for women with no history of drug abuse or dependence diagnosis was significantly different from the model for women with this history ($\chi^2(33) = 81.89, p < .00001$). When we examined the individual paths to see what pathways were truly different between the two groups we saw nine pathways which were statistically significantly different from zero in one group, but not in the other group. We then did individual tests to see which particular ones of this set of parameters were significantly different from each other in the two groups.

Six of the nine paths did differ significantly between the groups. There was a significant difference in the path from both support network and perceived control to support coping (Support Network $\rightarrow$ Support Coping: $\chi^2(1) = 9.48, p < .01$, Perceived Control $\rightarrow$ Support Coping: $\chi^2(1) = 12.21, p < .0005$). For women with a history of drug abuse or dependence diagnosis the size of their support network and their level of perceived control were

significantly positively related to their amount of support coping. This suggests that for those women with a history of a drug abuse/dependence diagnosis who felt in control and had more available supportive persons, they were more likely to utilize support as a coping response (Support Network: $\beta = .27$, $t(41) = 3.46$, $p < .002$; Perceived Control: $\beta = .16$, $t(41) = 2.60$, $p < .02$) (see Figure 4). In contrast, both of these paths were attenuated and not statistically significant in the model for women with no history of drug diagnosis (see Figure 3). There was also a significant difference between the groups in the strength of relationship between stressors and distress ($\chi^2(1) = 7.88$, $p < .005$). There was a stronger relationship between stressors and distress for women with no history of drug diagnosis ($\beta = .48$, $t(41) = 5.96$, $p < .00001$) (see Figure 3) than for women with a history of drug diagnosis ($\beta = .23$, $t(118) = 3.60$, $p < .001$), indicating that stress was a better predictor of distress for women with no history of drug diagnosis than for women with a history of drug diagnosis (see Figure 4). This represents a 50% reduction in the effect size relative to women without a history of drug abuse/dependence diagnosis. Finally, the effects of each of the three coping responses on distress differed significantly between the groups (Support Coping: $\chi^2(1) = 9.45$, $p < .003$; Active Coping: $\chi^2(1) = 8.42$, $p < .005$; and Avoidant Coping: $\chi^2(1) = 8.26$, $p < .005$). Higher support coping and active coping were associated with significantly lower levels of distress for women with no history of drug diagnosis (Support Coping: $\beta = -.21$, $t(41) = -2.64$, $p < .018$; Active Coping: $\beta = -.17$, $t(41) = -2.11$, $p < .045$) (see Figure 3), whereas neither were significant for women with a history of drug diagnosis (see Figure 4). For the women with a drug diagnosis history, both effects were attenuated, but the support coping effect was particularly so (Support Coping, $\beta = -.05$, $t(119) = -.69$, $p < .52$; Active Coping: $\beta = -.10$, $t(119) = -1.39$, $p < .17$), indicating that supportive and active coping responses did not reduce distress for women with a history of a drug abuse diagnosis. Avoidant coping had a significant positive effect on distress for both groups, though the effect was stronger for women with a history of drug diagnosis (No Diagnosis: $\beta = .39$, $t(41) = 4.98$, $p < .00001$; Diagnosis: $\beta = .59$, $t(119) = 9.43$, $p < .00001$). For women with a history of drug diagnosis, the size of the effect of avoidant coping on distress explained 34.8% of the variance, whereas the effect in women without a history of drug diagnosis, though statistically significant, only explained 15.2% of the variance in distress for those women. This indicates that avoidant coping strategies such as disengagement, distraction and suppression of thoughts were a better predictor of distress for women with a history of drug diagnosis than for women without a history of drug diagnosis.

Differences in Mediating Pathways

These differences in direct effects across the drug diagnosis groups lead only to two subtle differences in the patterns of indirect effects. Whereas the indirect effect of stressors on active and support coping were significant in the sample overall, they were not significant in either of the drug diagnosis groups, though the point estimates did not differ greatly.

Total effects are the sum of the direct and indirect effects. By comparing these across drug users some interesting differences become apparent. The standardized total effect between stressors and psychological distress was .63 for women with no history of drug abuse/dependence diagnoses, whereas it was only .44 for women with a history of a diagnosis – a 30% decline from the effect in women with no diagnosis history. The indirect effect between stressors and psychological distress was .15 for women with no history of diagnosis and .21 for women with a history of diagnosis – a 6% increase from the effect in women with no diagnosis history. This difference was driven by the change in the pathways from stress to avoidant coping and avoidant coping to distress.

Discussion

In the present study we examined a stress process model with history of substance abuse diagnosis as a moderator of the relationship between stressors and psychological distress in HIV-positive African American mothers. The results of the present study support much of the prior literature on the relationship between stressors and perceived control (see Brosschot et al., 1998). Controllability, a situational characteristic of particular stressors (Pearlin & Schooler, 1978) was measured here with respect to the general stressor load. Thus, HIV-positive African American mothers who had higher levels of stressors perceived their stressors as a whole to be less controllable.

As hypothesized, stressors had a strong positive influence on the amount of avoidant coping responses, while both available social support and perceived control were positively related to the level of active coping. Social support was also positively related to support coping, while perceived control was not. David and Suls (1999) found that perceived control was associated with more direct action, but lower support coping in men (of unknown HIV status). Only available social support had a significantly negative relationship with the amount of avoidant coping. This pattern of relationships between social support and active and support coping responses has also been seen in HIV-positive gay men (Wolf et al., 1991). The results from the current model show coping resources—available social support and perceived control were positively associated with active coping, and negatively associated with psychological distress.

Stress and avoidant coping were positively related to psychological distress, whereas perceived control and active coping were negatively related. The present analysis shows that avoidant coping is the most important predictor of psychological distress. Prior work has shown that avoidant coping has also been associated with poor medical adherence (Sherbourne, Hays, Ordway, & DiMatteo, 1992). Avoidant coping has also been specifically associated in HIV infection with lower quality of life (Swindells et al., 1999), more rapid progression of HIV (Mulder, de Vroome, van Griensven, Antoni, & Sandfort, 1999) and lower HIV medication adherence (Halkitis, Parsons, Wolitski, & Remien, 2003). Thus, avoidant coping appears to be linked to a range of negative outcomes. Based on these findings there are very clear reasons to target decreasing avoidant coping in any intervention efforts with HIV-positive African American women.

We also explored whether women who had a history of a drug abuse or dependence diagnosis differed either on levels of the study variables or the model pathways. Having a history of a drug use diagnosis (but not a current drug use diagnosis, which might be more associated with the use of drugs as a coping response) was posited as moderating the stress process model. That is, among HIV-positive African American mothers with a history of a drug abuse or dependence diagnosis, stressors would have a stronger positive relationship with psychological distress than those HIV-positive African American mothers without a history of a drug abuse or dependence diagnosis (i.e. drug abuse or dependence diagnosis will moderate or change the relationships of stressors, dissatisfaction with family, perceived control, social support, coping, and psychological distress). Women with a history of a drug diagnosis tended to have a larger support network, which they used as a means of coping. This finding is not surprising, especially if one considers that drug treatment programs are designed to influence support networks (e.g. outpatient drug treatment and support groups). Women with a history of a drug diagnosis also felt less in control; those who had higher levels of control were able to cope better. Interventions working with substance abusing HIV-positive women should target increasing self-efficacy and perceived control. Increased support coping did not map into reduced distress for women with a drug diagnosis history as it did in the women without a diagnosis history. Avoidant coping was positively related to distress for both groups, though the effect was stronger for women with a history of drug diagnosis. Women with a drug

diagnosis history have to deal with issues of drug relapse and recovery, which further challenges their ability to cope and may lead to increased distress. Despite women with a history of drug abuse or dependence diagnosis having a larger support network and increase support coping, these findings further underscore the negative relationship between drug abuse or more specifically for this study, past drug abuse history and psychological distress.

Limitations

There are some qualifications that need to be made concerning these results. First, while using structural equations methods, which are often associated with the idea of causal modelling, these data are cross-sectional, so the results may be thought of as being consistent with the hypothesized causal structure, but should not be construed as proving this causal structure. We believe that many of the hypothesized relationships are actually the result of reciprocally causal relations, which would be better addressed by an explicitly longitudinal model and data. Such a longitudinal model would likely have a developmental framework in which a woman's experience of distress would feedback into perceptions of stressors and responses to stressors at later times. Likewise, success or lack of success with coping responses would have an effect on future level of perceived control. This longitudinal test of the relationships of the current model would add validation of the current findings.

Second, structural equation modeling is a constructivist technique designed to evaluate the fit of a prescribed model to the data. In contrast to more traditional analytic methods, structural equation modeling is not designed to identify the best fitting model from among a set of variables. As a result, despite the good model fit observed in the present study, other models may have provided a comparable or better fit to the data.

Third, the only significant relationship between our measure of dissatisfaction with family and the other study variables was observed with stressors, with results showing a relatively strong relationship. Despite the fact that our measure of dissatisfaction with family provided adequate internal consistency, it is not a true estimate of family functioning. More adequate measures of family functioning and other resources variables need to be considered in future models.

Fourth, our assessments were home based, and therefore we cannot discount the possibility that the mothers' answers may have been influenced because of their perceived lack of privacy. However, as described above in the assessment procedures, efforts were made to minimize this bias by conducting assessments in quiet rooms and scheduling assessments during times when relatives would likely be out of the home.

Fifth, this is a convenience sample drawn from the assessments for a randomized clinical trial. It suffers from the potential lack of generalizability inherent to this type of data. For example, the distribution of demographic variables (e.g. education and income) may be different in this sample relative to the larger population of HIV-positive African American mothers. Moreover, the stress and coping process for our sample of stressed women could be quite different than a wide range of HIV-positive women. In particular, models estimated on selected samples tend to have attenuated estimates of relationships (Miller, 1994).

Another limitation of this study lies in what has not been done. This study does not directly examine cultural issues associated with being African American, female, or HIV positive. What is shown is that theoretically expected relationships between various measures of psychosocial functioning hold for these women as would be expected from research on other groups. However, there is a need for qualitative as well as quantitative research to examine the racial/cultural definition of these results. One potentially fruitful model for future research might test the relationship between family functioning, racial socialization, and race related stress in a stress process framework for urban, low-income HIV-positive African American women.

Conclusions and Clinical Implications

This article has attempted to elucidate the stress process in HIV-positive African American mothers. It has shown that coping resources (perceived control) and coping responses (active and avoidant) are important pathways in the process by which stressors are positively related to psychological distress in urban low-income HIV-positive African American women. Available social support is associated with lower psychological distress and more active coping responses. Perceived control of stressors is associated with higher amounts of active coping responses and lower psychological distress. The presence of stressors and dissatisfaction with family indicated that higher levels of stressors were associated with more dissatisfaction with family. Avoidant coping responses were, then, positively associated with distress. Avoidant coping responses are the single most important direct factor in explaining levels of psychological distress. Moreover, women with a history of drug diagnosis tended to have higher levels of coping resources and lower levels of avoidant coping; however, the positive relationship between avoidant coping and psychological distress was stronger for women with a history of drug diagnosis.

Identifying the determinants of difficulty in psychological adaptation to stressful events is important for the development and implementation of psychosocial interventions aimed at improving the well being of HIV-seropositive African American women. The effects of stress and psychological distress are particularly relevant for African Americans affected by both HIV/AIDS and substance abuse because (1) medication adherence and prevention of relapse are crucial to their well-being; (2) of the history of culturally based mistrust of medical institutions with regard to the origins and treatment of HIV/AIDS; (3) of their socioeconomic status; (4) both HIV/AIDS and substance abuse are stigmatized conditions. The latter two are particularly relevant for HIV-positive African American women whose social position (e.g. multiple vulnerable status – Black, female and low income) may heighten their susceptibility to distress. For example, Schulz, Parker, Israel, and Fisher (2001) found that life stressors associated with economic divestment contribute to the disproportionate burden of disease experienced by African American women residing in urban communities. These factors may magnify both the incidence of stress as well as the reactivity to stress.

The present results may have practical implications for intervening with HIV-positive African American women. Studies have shown that psychological distress has the potential to accelerate the progression of HIV (Cruess et al., 2000b) and that behavioral interventions have the potential to slow the progression of HIV by reducing distress (Antoni et al., 2000; Cruess et al., 2000a). As measured by the Brief Symptom Inventory (Derogatis, 1993), Szapocznik et al. (2004) found that, on average, HIV-positive African American mothers scored at or above the clinical threshold for distress (.83; Derogatis, 1993). Given the results of these studies it is imperative that interventions targeting HIV-positive individuals are tailored to decrease psychological distress.

These results point to several promising avenues for interventions. First, working directly on the reported family dissatisfaction and building skills to enhance perceived control would potentially decrease the amount of psychological distress. Second, working on recruitment, maintenance and utilization of available social support would have beneficial effects on the constellation of coping responses. Having supportive and positive persons in one's network could increase supportive coping and coping strategies such as planning and taking action, while decreasing the use of avoidant coping strategies such as disengagement, distraction and suppression of thoughts as a coping response. Finally, for substance abusing HIV-positive women, encouraging and demonstrating the utility of more active and less avoidant coping responses should have direct benefits on psychological distress.

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Figure 1.
Proposed stress-process model of psychological distress in HIV-positive African American mothers.

Figure 2.

Dissatisfaction with family and the stress process. # Indicates that $0.05 < p < 0.10$. Note that hypothesized paths with $p > 0.10$ are not shown in the model results, above. However, they were retained in the model.

Figure 3.

Stress process for individuals with no history of drug abuse or dependence.

Figure 4.

Stress process for individuals with history of drug abuse or dependence.

Table I

Demographics.

Characteristic	History of drug abuse or dependence diagnosis (<i>n</i> = 141)	Non-drug abuse or dependence diagnosis history (<i>n</i> = 65)	Total (<i>n</i> = 265)
Mean age (std. dev.)	37.92 (6.27)	31.05 (9.17)	35.43 (8.44)
Median personal income	\$6,900	\$7,116	\$6,732
Median family income	\$9,840	\$9,600	\$9,636
Working (%)	18.4	24.6	21.9
Receiving public assistance (%)	85.8	78.5	81.5
Less than high school diploma (%)	50.4	53.8	49.8
High school diploma (%)	19.9	20.0	19.2
Completed technical school (%)	10.6	4.6	8.7
Some college or 2 year degree (%)	17.7	21.5	21.1
Four-year college degree (%)	1.4	0	1.1
Never married (%)	36.9	53.8	42.6
Married (%)	26.3	13.9	19.3
Living w/partner (%)	17.7	16.9	19.2
Mean number of children	3.11 (1.91)	2.92 (1.70)	1.94 (1.84)
Mean T-cell count	473.52 (297.21) ^a	435.23 (323.72)	453.09 (299.22)

Note.^a
n = 139.

Table II

Means, standard deviations and group differences in history of drug abuse or dependence diagnosis and non-history of drug abuse or dependence diagnosis.

<i>n</i> = 206	Non-history of drug abuse or dependence diagnosis	History of drug abuse or dependence diagnosis	<i>t</i>	<i>p</i> -Value
BSI-General Severity Index	0.94 (0.09)	1.05 (0.06)	-1.06	0.29
Avoidant coping	38.46 (1.2)	36.02 (0.81)	1.69	0.09
Active coping	25.14 (0.55)	25.58 (0.4)	-0.64	0.52
Support/comfort coping	19.66 (0.6)	22.38 (0.4)	-3.57	0.00
Perceived control	39.15 (0.73)	36.89 (0.58)	2.28	0.02
Social support ^a	12.28 (0.78)	14.44 (0.71)	-2.05	0.04
Dissatisfaction with family	15.12 (1.43)	16.23 (1.08)	-0.60	0.55
Stressors	-0.38 (0.27)	0.13 (0.2)	-1.44	0.15

Note.

^aSocial support had evidence of unequal variances across groups and *df* = 164.4. For all other tests *df* = 204.