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Psychosocial and Physiologic Correlates of Perceived Health Among HIV-infected Women

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Abstract

The purpose of this study was to identify factors related to perception of physical health in a cohort of HIV-infected women. A descriptive correlational design was used to identify factors influencing perceived physical health in a sample of 275 HIV-infected women in Georgia, South Carolina, and North Carolina. Participants were predominantly single African-American women with household incomes of less than \$10,000 per year.

Using Spearman's *rho*, statistically significant positive correlations ($p < .05$) were found between perceived physical health and T helper cell count, hope, present life satisfaction, education, and income. Statistically significant positive correlations ($p < .05$) were observed between perceived physical health and three HIV-specific active coping styles (managing the

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illness, focusing on others, and positive thinking). Inverse relationships were observed between perceived physical health and HIV-related symptoms, stage of illness, depression, physical and sexual violence experienced since becoming HIV-infected, history of drug use since becoming HIV-infected, and age. Using backward stepwise selection, 9 of 14 variables were retained in the final model that explained 60% of the variance in physical health at the $p < .10$ level of significance ($R^2 = .60$). Variables that demonstrated a significant relationship with perceived physical health were HIV-related symptoms, depression, present life satisfaction, age, education, coping by managing the illness, coping through positive thinking, and coping by focusing on the present. These findings support the need to address the psychosocial as well as the physiologic factors associated with HIV/AIDS in developing comprehensive plans of nursing care.

Keywords: HIV; AIDS; Women; Perceived Health; Coping; Physical Health

Psychosocial and Physiologic Correlates of Perceived Health Among HIV-infected Women

Introduction

¹Centers for Disease Control & Prevention. (2000). HIV/AIDS surveillance report.

Morbidity and Mortality Weekly Report 11, 1-44

²ibid

³ibid

⁴Distabile, P., Dubler, N. N., Solomon, L., & Klein, R. S. (1999). Self-reported legal needs of women with or at risk for HIV infection. *Journal of Urban Health*, 76, 435-447

⁵Anastos, K., Denenberg, R., & Solomon, L. (1998). Clinical management of HIV-infected women (pp. 339-348). In Wormser, G.P., *AIDS and other manifestations of HIV disease*. Philadelphia: Lippincott-Raven.

⁶Russell, J. M. & Smith, K. (1998). HIV-infected women and women's services. *Health Care Women for Women International*, 19, 131-139

⁷Mizuno, Y., Moneyham, L., Sowell, R. L., Demi, A. & Seals, B. (1998). Effects of sociodemographic factors, stage of illness, and perceived stigma on the identification of a support person among women with HIV infection. *Sociological Spectrum*, 18, 5-23

⁸Anastos, 1998.

⁹Hankins, C.A., & Handley, M. A. (1992). HIV disease and AIDS in women: Current knowledge and a research agenda. *Journal of Acquired Immune*

Over the past decade the proportion of AIDS cases in adult and adolescent females ages 13 to 49 has tripled, making women one of the fastest growing segments of the population being diagnosed with HIV/AIDS.¹ African-American and Hispanic women represent a disproportionate number of new cases of HIV/AIDS.² Additionally, the number of newly diagnosed cases of HIV/AIDS has dramatically increased in the southern region of the United States.³ Often, HIV-infected women are poorer, come from racial and ethnic minorities, and have fewer resources than other women.⁴ Many HIV-infected women are of reproductive age, family caregivers, and/or single heads of households with dependent children.⁵ Women at highest risk of HIV infection are more likely to live in poverty and be involved with or connected to substance use activities.^{6,7} Negative life situations experienced by many HIV-infected women potentially affect not only their physical health but also perceptions of their health. However, there is little understanding of the contributions of psychosocial factors and HIV-related disease markers to perceived physical health. The purpose of this study was to identify correlates of perceived physical health in a cohort of HIV-infected women.

Relevant Literature

While there is limited evidence of significant gender-based biologic difference in the progression of HIV disease,⁸ there is growing evidence that differences in HIV-related morbidity and mortality in women may be related to issues of availability and access to

Deficiency Syndrome and Human Retrovirology, 10, 967-971.

¹⁰Keenlyside, R.A., Johnson, A.M., & Mabey, D.C.W. (1993). The epidemiology of HIV-1 infection and AIDS in women, *AIDS*, 7, S33-S38.

¹¹Sowell, R. L., Moneyham, L. & Aranda-Naranjo, B. (1999). The care of women with AIDS. *Nursing Clinics of North America*, 34, 179-199.

¹²Zierler, S., Witbeck, B., & Mayer, K. (1996). Sexual violence against women living with or at risk for HIV infection. *American Journal of Preventive Medicine*. 12, 304-310.

¹³Bureau of Justice Statistics. (1994). *Criminal victimization 1994: National crime victimization survey* (Pub No. NCJ-158022). Annapolis Junction, MD: Bureau of Justice Statistics Clearinghouse.

¹⁴Minkoff, H. L., & DeHovitz, J. A. (1991). Care of women with the human immunodeficiency virus. *Journal of the American Medical Association*, 266, 2253-2258.

¹⁵Sowell, 1999.

¹⁶Morris, N. J. (1996). Depression and HIV+ disease: A critical review. *Journal of the American Psychiatric Nurses Association*, 2, 154-163.

¹⁷Low-Beer, S., Chan, K., Yip, B., Wood, E., Montaner, J. S., O'Shaughnessy, M. V., & Hogg, R. S. (2000). Depressive symptoms decline among persons on HIV protease inhibitors. *Journal of Acquired Immune Deficiency Syndrome*, 23, 295-301.

¹⁸Penzak, S. R., Reddy, Y. S. & Grimsley, S. R. (2000). Depression in

resources and services.^{9,10} Women with HIV infection often live in poverty and extremely stressful and chaotic circumstances that include homelessness, substance abuse, and violent relationships.¹¹ Women at highest risk for HIV infection may already be highly stigmatized, as well as, represent groups less likely to access health care services. An HIV diagnosis places women at even greater risk for stigma, depression, using negative coping strategies, and experiencing a sense of hopelessness.^{12,13} Due to their traditional role as caregiver, women often place other family members' needs ahead of their own.¹⁴ This situation is especially true for women with children whose first priority is the care of their children.¹⁵ The complex interactions of these factors may contribute to a woman's risk of becoming HIV-infected, affect disease progression, decrease her likelihood of obtaining quality health care, and influence her sense of well-being.

Depression is one of the most frequently reported psychiatric manifestations of HIV infection.¹⁶ As many as one-half of HIV-infected persons report significant levels of depression,^{17,18} making depression a particularly important factor in determining health and in HIV-infected women's evaluation of their health. Depression has been linked with poor adherence to antiretroviral therapy.¹⁹

patients with HIV infection. *American Journal of Health-System Pharmacy*, 57, 376-386.

¹⁹Catz, S. L., Kelly, J. A., Bogart, L. M., Benotsch, E. G. & McAuliffe, T. L. (2000). Patterns, correlates, and barriers to medication adherence among persons prescribed new treatments for HIV disease. *Health Psychology*, 19, 124-133.

²⁰Mayne, T., Vittinghoff, E., Chesney, M., Barrett, D. C., & Coates, T. J. (1996). Depressive affect and survival among gay and bisexual men infected with HIV. *Archives of International Medicine*, 156, 2233-2238.

²¹Valente, S. & Saunders, J. (1997). Managing depression with people with HIV disease. *Journal of the Association of Nurses in AIDS Care*, 8, 51-67.

²²Crandall, C. S., & Coleman, R. (1992). AIDS-related stigmatization and the disruption of social relationships. *Journal of Social and Personal Relationships*, 9, 163-177.

²³Miles, M. S., Burchinal, P., Holditch-Davis, D., Wasilewski, Y. & Christian, B. (1997). Personal, family, and health-related correlates of depressive symptoms in mothers with HIV. *Journal of Family Psychology*, 11, 23-34.

²⁴Link, B. G., Struening, E. E., Rahav, M., Phelan, J. C. & Nuttbrock, L. (1997). On stigma and its consequences: Evidence from a longitudinal study of men with dual diagnoses of mental illness and substance abuse. *Journal of Health and Social Behavior*, 38, 177-190.

²⁵Fife, B. L. & Wright, E.

Further, depression may contribute to the hastening of HIV disease progression.²⁰ As individuals become symptomatic and exhibit an increased number of symptoms, they experience greater depressive symptoms and engage in unhealthy self-care behavior²¹ further undermining their health and perceptions of well-being.

It is well documented that there is a high level of stigma associated with being HIV infected.²² Further, stigma has been linked with lower self-concept, poorer emotional outcomes, and greater psychological distress in mothers with HIV.²³ Stigma may prevent HIV-infected women from accessing needed health services²⁴ and may affect their functional health status and perceptions of disease severity.²⁵

R. (2000). The dimensionality of stigma: A comparison of its impact on the self of persons with HIV/AIDS and cancer. *Journal of Health and Social Behavior, 41*, 50-67.

²⁶Zierler, S., Cunningham, W. E., Andersen, R., Shapiro, M. F., Nakazono, T., Shapiro, M. F., Nakazono, T., Morton, S., Crystal, S., Stein, M., Turner, B., St. Clair, P., & Bozzette, S. A. (2000). Violence victimization after HIV infection in a US probability sample of adult patients in primary care. *American Journal of Public Health, 90*, 208-215.

²⁷House, J. S., Landis, K. R. & Umberson, D. (1988). Social relationships and health. *Science, 241*, 540-545.

²⁸Kiecolt-Glaser, J. K., Fisher, L. D., Ogrocki, P., Stout, J. C., Speicher, C. E., Glaser, R. (1987). Marital quality, marital disruption, and immune function. *Psychosomatic Medicine, 49*, 13-34.

²⁹Kiecolt-Glaser, J. K., Malarkey, W. B., Chee, M., Newton, T., Cacioppo, J. T., Mao, H. Y., & Glaser, R. (1993). Negative behavior during marital conflict is associated with immunological down-regulation. *Psychosomatic Medicine, 55*, 395-409.

³⁰Barroso, J. (1993). Reconstructing a life: A nursing study of long term survivors of AIDS. Unpublished doctoral dissertation, University of Texas at Austin.

³¹Carson, V., Soeken, K. L., Shanty, J. & Terry, J. (1990). Hope and spiritual well-being: Essentials for living with AIDS. *Perspectives in Psychiatric Care, 26*, 28-34.

Additionally, many HIV-infected women are at risk for psychologic, physical, and sexual violence within their communities and family relationships.²⁶ Such experiences of violence can both directly and indirectly affect women's perceptions of their health, as well as their actual health status. A growing body of evidence documents the value of nurturing relationships on quality and length of life.^{27,28} Likewise, discordant relationships have been shown to be damaging to physical health.²⁹

While there have been greater feelings of stigma and depression documented among HIV-infected women, many women characterize themselves as hopeful, optimistic, and healthy.³⁰ Research suggests that HIV-infected individuals who remain hopeful experience a greater sense of well-being, more actively participate in their own health care, and are able to manage their health better.³¹ Further, a significant relationship has been observed between active coping and increased natural killer cell cytotoxicity in HIV-

³²Goodkin, K., Blaney, N. T., Feaster, D., Fletcher, M. A., Baum, M. K., Mantero-Atienza, E., Klimas, N. G., Millon, C., Szapocznik, J., & Eisendorfer, C. (1992). Active coping style is associated with natural killer cell cytotoxicity in asymptomatic HIV-1 seropositive homosexual males. *Journal of Psychosomatic Research*, *36*, 635-650.

³³Fleishman, J. A. & Fogel, B. (1994). Coping and depressive symptoms among people with AIDS. *Health Psychology*, *13*, 156-169.

³⁴Nunes, J. A., Raymond, S. J., Nicholas, P. K., Leuner, J. D. & Webster, A. (1995). Social support, quality of life, immune function, and health in persons living with HIV. *Journal of Holistic Nursing*, *13*, 174-198.

³⁵Sowell, R. L., Cohen, L., Demi, A., & Moneyham, L. (1995). Family responses to HIV/AIDS: Stressors, resistance factors, and adaptational outcomes. Unpublished final report. Cooperative Agreement U64/CCU408293. Atlanta: Centers for Disease Control and Prevention.

³⁶Weinfurt, K. P., Willke, R. J., Glick, H. A., Freimuth, W. W. & Schulman, K. (2000). Relationship between CD4 count, viral burden, and quality of life over time in HIV-1 infected patients. *Medical Care*, *38*, 404-410.

³⁷Burgess, A.P., Irving, G., & Riccio, M. (1993). The reliability and validity of a symptom checklist for use in HIV infection: A preliminary analysis. *International Journal of STD and AIDS*, *4*, 333-338.

³⁸Cleary, P. D., Fowler, F.

infected persons,³² and avoidance coping was related to increased psychological distress.³³ Additionally, perceived health status has been shown to influence the way individuals approach their lives and their health and to affect their hope for the future.

Although Nunes and associates³⁴ found no relationship between stage of illness or perceived health status in persons with HIV disease, for many women with HIV infection there is an important distinction between having HIV and having AIDS.³⁵ Physical symptoms associated with HIV infection, declining T helper cells (CD4+), and rising HIV-RNA viral loads indicate disease progression and influence quality of life.³⁶ In general, declining T helper cells mark disease progression, and declining HIV-RNA viral loads with therapy indicate treatment effectiveness. The aim of pharmacotherapy in HIV disease is to maintain the highest level of CD4+ cell counts and the lowest HIV-RNA viral loads possible. Additionally, HIV-related symptoms have been found to be predictive of perceived health status.^{37,38} CD4+ count is a well-known marker of HIV disease progression that holds great symbolic meaning for HIV-infected individuals.

J. Jr., Weissman, J., Massagli, M. P., Wilson, I., Seage, G. R. 3rd., Gatsonis, C., & Epstein, A. (1993). Health-related quality of life in persons with acquired immune deficiency syndrome. *Medical Care, 31*, 569-580.

This study sought to determine contributions of a number of psychosocial factors and physiologic markers of HIV infection on the perception of physical health in a cohort of HIV-infected women. Independent variables examined included: (a) demographic characteristics, (b) physical health status, (c) HIV-related symptoms, (d) physical and sexual violence, (e) history of drug use since HIV-infected, (f) depression, (g) perceived stigma, (h) hope, (i) present life satisfaction, and (j) coping strategies.

Methods

Sample

Data for this study were drawn from a three-year longitudinal study of reproductive decision-making and factors influencing decisions to take zidovudine (ZDV) in a group of HIV-infected women. The Health Belief Model³⁹ served as the conceptual framework and guided the selection of the variables in the larger study including those examined in this analysis. The Health Belief Model supports the importance of an individual's perceptions on health-related behaviors and outcomes. The current research examined the influence of psychosocial and physiologic factors on women's perceived physical health. Since the vast majority of women

³⁹Rosenstock, I. M. (1994). Historical origins of the health belief model. In: Becker, M. (ed.), *The health belief model and personal health behavior*. Thorofare, NJ: Charles Slack.

being diagnosed with HIV infection are of reproductive age, it is especially appropriate to examine correlates of physical health in current sample of women. The sample consisted of 322 women recruited from 12 health clinics and AIDS service organizations in Georgia, North Carolina, and South Carolina. Women in this study spoke English and identified themselves as being HIV-infected, of reproductive age (17 to 48 years), sexually active, and at risk for becoming pregnant. Women who were currently pregnant, who had been sterilized, or who had an indwelling contraceptive device were excluded from the study. Women who used condoms as their only method of contraception were included because of the high failure rate of condoms and the fact that many women did not consistently use condoms with all of their sex partners. Forty-seven women failed to provide sufficient data on the instruments used in this study and were excluded from data analysis leaving a sample of 275.

Procedure

Female research assistants recruited women in Georgia, North Carolina, and South Carolina who potentially met selection criteria. A brief screening questionnaire was used to document eligibility for participation. Prior to data collection, this study received approval from the Institutional Review Board of the University of

South Carolina. Research assistants read the questions on a structured questionnaire to the participants and recorded their answers *verbatim*. Interviews were conducted at one of the cooperating agencies or at a site chosen by the participant that would maximize the privacy, convenience, and comfort of the participant. Each woman was paid \$40.00 for her participation.

Instruments

Demographic characteristics. Demographic characteristics were obtained using a demographic data form designed specifically for this study. Demographic characteristics that were thought to influence or to be indicative of a woman's health status were examined. Participants were asked to provide information regarding age, race, marital status, education, employment status, income, and type of community in which they lived (i.e., urban, suburban, or rural). In addition, the women were asked to report the number of their living children, pregnancies, live births, and HIV-infected children since they had become HIV-infected. The women were asked to identify their stage of illness as asymptomatic HIV disease, symptomatic HIV disease, or AIDS. Stage of illness was verified through self-reported CD4+ cell counts and symptoms.

⁴⁰Cunningham, W. E., Rana, H.M., Shapiro, M. F. & Hays, R. D. (1997). Reliability and validity of self-report CD4 counts in persons hospitalized with HIV disease. *Journal of Clinical Epidemiology*, 50, 829-835.

⁴¹ibid

⁴²Ware, J. E. Kosinski, M. & Keller, S. D. (1994). *SF-36 physical and mental summary scales: A user's manual*. Boston: The Health Institute.

⁴³Brazier, J. E., Harper, R., Jones, N. M., O' Cathain, A., Thomas, K. J., Usherwood, T., & Westlake, L. (1992). Validating the SF-36 health survey questionnaire: New outcome measure for primary care. *British Medical Journal*, 305, 160-164.

⁴⁴Ware, 1994

T helper cells (CD4+). T helper cell (CD4+) count was self-reported. Cunningham⁴⁰ studied the extent of agreement between self-reported CD4+ cell counts and medical record CD4+ cell counts. The fact that CD4+ cell counts by these two methods did not differ significantly and were highly correlated using Pearson's *r* supports the validity of self-reported CD4+ cell count.⁴¹

Perceived physical health. Perceived physical health was measured using the physical health summary score of the Medical Outcomes Study 36-Item Short Form Health Survey (SF-36).⁴² The SF-36 comprises 36 items, eight scales, and two summary-scores (physical health and mental health). The SF-36 has consistently demonstrated reliability ($\alpha > .85$) and validity by distinguishing between groups with expected health differences.⁴³ Twenty-one items and four scales constitute the physical health summary scale (physical functioning, role-physical, bodily pain, and general health).⁴⁴ The physical health summary score was used to measure perceived physical health because it captures all these dimensions of physical health. A higher score indicated greater perceived physical health. Psychometric data for each of the instruments used in this study are further described in [Table 1](#).

Depression. Depression was measured using the short form of the Centers for Epidemiological

⁴⁵Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

Studies Depression Scale (CES-D, Iowa Form). The short form consists of 11 Likert-type items that were simulated from the original 20-item version of the CES-D (Yale Form).⁴⁵

Respondents were asked to indicate how frequently they have experienced depressive symptoms in the past week. Items were rated on a 4-point scale ranging from “rarely” (1) to “most of the time” (4). Responses for the 11 items were summed. The total score was used to measure depression. A higher score indicated greater depression.

⁴⁶Sowell, 1995.

Stigma. The Perceived Stigma Scale (PSS) was used to measure perceived stigma. The PSS is a 13-item scale that was developed and used by a member of this research team in a previous study.⁴⁶ The women were asked to report how often they had experienced stigmatizing thoughts or feelings within the past 6 months. Sample items included “I feel blamed by others for my illness,” or “I think my illness is a punishment for things I have done in the past.” The validity of this instrument is supported by the fact that the items were drawn from focus groups of women with HIV and experts in the area of HIV/AIDS, as well as HIV-infected individuals, reviewed and approved each of the items. A higher score indicated greater perceived HIV-related stigma.

Life satisfaction. Present life satisfaction was measured using the Life Satisfaction Scale

⁴⁷Cantril, H. (1965). *The pattern of human concerns*. New Brunswick, NJ: Rutgers University Press.

(LSS).⁴⁷ The Present Life Satisfaction Scale measures satisfaction in seven domains, physical status, family and friends, emotional status, financial state, spiritual well-being, peace of mind, and overall satisfaction with life. For each of these domains, participants were asked to indicate where on the 10-point ladder they presently stand. The total score for present LSS incorporating each of the seven domains was used to provide the broadest measure of general life satisfaction. A higher score indicated greater present life satisfaction.

⁴⁸Herth, K. (1991). Abbreviated instrument to measure hope: Development and psychometric evaluation. *Journal of Advanced Nursing*, 17, 1251-1259.

Hope. Hope was measured using the Herth Hope Index (HHI).⁴⁸ Twelve items that are rated on a 4-point, Likert scale comprise the short form of the HHI. Three subscales measure the cognitive-temporal (a positive perception that a desired outcome is realistically possible), affective-behavioral (confidence and initiation of plans for the desired outcomes), and affiliative-contextual (interdependence and interconnectedness with others) dimensions of hope proposed by Dufault and Martocchio.⁴⁹ The total score for the HHI was used to measure hope. A higher score indicated greater hope.

⁴⁹Dufault, K. J. & Martocchio, B. C. (1985). Hope: Its spheres and dimensions. *Nursing Clinics of North America*, 20, 379-391.

Physical and sexual violence. The Physical and Sexual Violence Scale (PSVS) was used to measure physical and sexual violence. The six items of the PSVS related to physical and sexual violence were taken from the Interpersonal

⁵⁰Sowell, R. L., Seals, B. F., Moneyham, L., Demi, A., Cohen, L., & Brake, S. (1997). Quality of life in patients with human immunodeficiency virus infection: Impact of social support, coping style, and hopelessness. *AIDS Care*, 9, 501-512.

Violence Scale (IVS), an eight-item scale measuring verbal, physical, and sexual abuse, that has been previously used in research of violence against women.⁵⁰ The IVS was designed to measure (a) verbal abuse, such as being yelled at, humiliated, or made to feel worthless; (b) physical abuse, such as being punched, kicked, tied up, or threatened with a weapon; and (c) sexual abuse, such as being forced to have sex or perform sexual acts against one's will. A higher score on the PSVS indicated greater physical and sexual violence.

⁵¹Moneyham, 1999

History of drug use. History of drug use was measured with a 9-item instrument, the History of Drug Use Scale, that asked women if they ever used tobacco, alcohol, alcohol to intoxication, marijuana, cocaine, heroin, methadone, inhalants or other substances.⁵¹ Responses were coded as "yes" or "no." Women who acknowledged ever using any of the aforementioned substances were asked how often they had used the substance in the last 30 days. A higher score indicated greater diversity in the types of substances used.

⁵²Sowell, 1997

HIV-related symptoms. HIV-related symptoms were measured using the HIV Symptom Scale (HSS), a 19-item instrument containing common problems associated with HIV disease.⁵² This instrument has been used previously and was reviewed by two medical

⁵³Sowell, 1995

experts at the Centers for Disease Control and Prevention experienced in the care of HIV-infected women⁵³. Participants were instructed to “Tell me whether you have had these symptoms during the past 6 months.” Responses were coded as “yes” or “no.” Affirmative responses were summed for a total score. A higher score indicated that the participant had experienced a greater number of the symptoms related to HIV disease.

⁵⁴Demi, A., Moneyham, L., Sowell, R. L. & Cohen, L. (1997). Coping strategies used by HIV-infected women. *Omega*, 35, 377-391.

⁵⁵Moneyham, L., Hennessy, M., Sowell, R., Demi, A., Seals, B., & Mizuno, Y. (1998). The effectiveness of coping strategies used by HIV-seropositive women. *Research in Nursing and Health*, 21, 351-362.

⁵⁶Moneyham, L., Demi, A., Mizuno, Y., Sowell, R., Seals, B., & Guillory, J. (1998). Development and testing of a culturally relevant measure of coping for use with HIV-infected women. *Omega*, 36, 359-374.

Coping. Coping was measured using the HIV Coping Scale (HCS), a 54-item scale that was developed and tested in a population of HIV-infected women in a three-year longitudinal study of HIV on women and their families.^{54,55} The HCS was initially tested in 194 and 184 women, respectively, who completed the scale at two different data points. The HCS has demonstrated a total scale alpha coefficient of .90.⁵⁶ In the present study, factor analysis using maximum likelihood extraction with Promax rotation revealed seven sub-scales or ways of coping in the current study. These included: (1) avoidance coping, (2) using social support, (3) using spiritual activities, (4) managing the illness, (5) focusing on others, (6) information seeking, and (7) positive thinking.

Data Analysis

Frequencies and percentages were calculated for

each demographic characteristic in the study. All variables used in this analysis achieved either ordinal or interval level. Associations between the psychosocial variables (independent) and perceived physical health were tested using Spearman's coefficient of correlation (Spearman's *rho*). The a priori level of significance for the bivariate correlations was set at $p = .05$. Subsequently in order to select the variables most highly related to perceived physical health, a backward stepwise selection model was used. Because of the exploratory nature of this study, the a priori level of significance for the associations tested in the backward stepwise selection model was set at $p = .10$.

Findings

The women in this study were predominantly poor (65.5% had annual incomes less than \$10,000), African-American women (86.7%) who lived urban areas (60.4%) of the Southeast. The women were receiving health care and social services in a variety of settings that included community-based AIDS organizations, private physicians' offices, and AIDS-specific health clinics. The sample is further described in [Table 2](#).

The relationships between perceived physical health and the independent variables were tested

using Spearman's *rho*. See [Table 3](#).

A backward stepwise selection model was constructed to test the relationship of each of the psychosocial variables that achieved significance in the bivariate correlations with perceived physical health. In the final step of an eight step, statistically significant model ($F = 28.7_{9,169}$, $p = .00$), nine variables remained that explained 55.7% ($R^2 = .60$) of the variance in perceived physical health. See [Table 4](#).

Discussion

Women participating in this study were predominantly poor, African-American women. The demographic characteristics of this convenience sample closely represent women receiving care and services in the agencies where the data were collected. However, participants were not randomly sampled and they may not be representative of HIV-infected women not currently receiving health care or social services, women receiving care and/or service from other agencies, or women living in other regions of the United States. Therefore, caution should be used in regard to generalizing these findings to other groups of HIV-infected women. With these limitations, the current findings do provide important insights into factors related to perceived physical health in one of the most rapidly growing groups being infected with HIV.

All factors that demonstrated significant bivariate relationships with perceived physical health were entered as independent variables in a backward stepwise selection regression model. Nine variables retained their significance with perceived physical health ([Table 4](#)).

Understandably, HIV-related symptoms accounted for most of the variance in the model to predict perceived physical health. This finding is consistent with the work of Sousa, Holzemer, Henry, and Slaughter,⁵⁷ who found that symptom status explained the greatest amount of the variance in health-related quality of life in persons with HIV disease. The physical symptoms related to HIV disease are very troublesome and, at times, devastating making the management of HIV-related symptoms a priority for clinicians. Our findings suggest that adequate management of symptoms not only has direct benefits on health, but also may have indirect benefits related to increasing the individual's perception of better health. Equally important is the further development and testing of empirically based interventions by researchers to address HIV symptoms.

Hope ($\beta = .36, p = .01$), depression ($\beta = -.26, p = .02$), and life satisfaction ($\beta = .12, p = .06$) are inextricably related to perceived physical health. Consistent with other researchers,^{58,59} these relationships provide an empirical basis for assessing these factors as part of each HIV-

⁵⁷Sousa, K. H., Holzemer, W. L., Henry, S. B., & Slaughter, R. (1999). Dimensions of health-related quality of life in persons living with HIV disease. *Journal of Advanced Nursing*, 29, 178-187.

⁵⁸Mayne, 1996

⁵⁹Swindells, S. Mohr, J., Justis, J. C., Berman, S., Squier, C., Wagener, M. M., & Singh, N (1999). Quality of life in patients

with human immunodeficiency virus infection: Impact of social support, coping style, and hopelessness. *International Journal of STD and AIDS*, 10, 383-391.

⁶⁰Szirony, T. A. (1999). Infection with HIV in the elderly population. *Journal of Gerontological Nursing*, 25(10), 25-31.

assessing these factors as part of each HIV-infected person's nursing care. The relationship between age and perceived physical health found in this study may be a function of how long the person has been HIV-infected, disease progression, and/or fatigue from managing the illness. Additionally, the physical effects of the aging process in conjunction with long term side effects associated with HIV treatments cannot be discounted as factors that cause women to view themselves as less healthy as they age. Our findings support the need for clinicians to consider age as a potentially important factor in developing individual plans of care. In fact, because the CDC has estimated that 10% of cases of HIV disease are in individuals greater than 50 years of age, an increasing number of health care professional are recognizing the need for empirical studies of all aspects of HIV infection in older adults.⁶⁰ Further, our findings demonstrated that higher educational levels were associated with greater perceived physical health. It may be that education gives women the tools to better maneuver through the health care system and to facilitate self care and health promotion behaviors.

The findings of this study support the hypothesis that an individual's perception of physical health is related to many other factors in addition to their physiologic status. In the simple correlations using Spearman's *rho*, all the

variables examined in this study were significantly related to perceived physical health supporting these factors as correlates of perceived physical health. This finding supports those of other researchers who have proposed that perceived physical health is the result of a complex interaction of both physiological markers of health and psychosocial factors.⁶¹ Complex interactions of psychosocial and physical factors contribute to an individual's interpretation of personal health status and well-being.⁶²⁻⁶⁴ Nursing educators must instill in their students that health status and well-being are influenced by a constellation of psychosocial as well as physiologic factors. A comprehensive assessment of the complex psychosocial and physical problems experienced by HIV-infected women provides a basis for developing effective nursing interventions to address these needs. Comprehensive treatment plans that address psychosocial factors in addition to the physical symptoms of HIV disease will be most beneficial in caring for HIV-infected women.

⁶¹Coker, A.L., Smith, P.H., Bethea, L., King, M.R. & McKeown, R.E. (2000). Physical health consequences of physical and psychological intimate partner violence. *Archives of Family Medicine*, 9, 451-457.

⁶²Sousa, 1999

⁶³Coleman, C.L. & Holzemer, W.L. (1999). Spirituality, psychological well-being, and HIV symptoms for African Americans living with HIV disease. *Journal of the Association of Nurses in AIDS Care*, 10, 42-50.

⁶⁴Rabkin, J.G., Williams, J.B., Neugebauer, R., Remien, R.H. & Goetz, R. (1990). Maintenance of hope in HIV-spectrum homosexual men. *American Journal of Psychiatry*, 147, 1322-1326.

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Table 1. Description of the Research Instruments.

Instrument	Number of Items	Actual Range	<i>M</i>	<i>SD</i>	α
Physical Health Summary Score	21	26 – 70	54.1	11.3	.89
HIV-related Symptoms	19	19 – 37	24.1	4.3	.86
Physical and Sexual Violence Experienced Since Becoming HIV-Infected	6	7 – 32	11.4	4.4	.86
History of Drug Use after Becoming HIV-infected	9	9 – 16	8.7	1.1	.80
Depression	11	11 – 43	23.0	6.5	.77
Stigma	13	12 – 49	24.2	7.6	.82
Hope	12	20 – 48	38.0	5.4	.90
Present Life Satisfaction	7	16 – 70	48.5	11.4	.80
Managing the Illness	9	9 – 36	29.6	4.5	.78
Focusing on Others	4	4 – 16	13.0	2.2	.74
Positive Thinking	3	3 – 12	10.1	1.8	.66

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Table 2. Description of the Sample.

Characteristic	N	%
Race		
African-American	222	86.7
Other	34	13.3
Missing	19	
Age (years)		
15 – 27	80	29.1
28 – 32	57	20.7
33 – 39	91	33.1
40 – 48	47	17.1
Religion		
Baptist	147	53.8
Other Protestant	80	29.3
Methodist/AME	24	8.8
Catholic	13	4.8
Other	9	3.3
Missing	2	
Marital Status		
Partnered	55	17.8
Single	220	82.2
Annual Household Income		
< \$5000	81	30.7
\$5000-\$9999	92	34.8
>\$10,000	91	35.5
Missing	11	
Employment Status		
Unemployed	180	65.5
Part-time	53	19.3
Full-time	42	15.3
Education		
< High school	90	23.0
High school	102	37.4
Some college	60	22.0
College graduate	17	6.2
Graduate school	4	1.5
Residence		
Urban	166	60.4
Suburban	49	17.8
Rural	60	21.8
Stage of Disease		
Asymptomatic	168	61.1
Symptomatic	70	25.5
AIDS	37	13.5

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Table 3. Bivariate Correlates of Perceived Physical Health

Direction of Relationship	Variable	<i>Rho</i>	<i>P</i>
Positively related	T helper cell count	.39	.00
	Hope	.38	.00
	Life satisfaction	.42	.00
	Education	.14	.02
	Income	.14	.03
	Coping – managing the illness	.14	.02
	Coping – focusing on others	.15	.01
	Coping – positive thinking	.28	.00
Negatively related	HIV-related symptoms	- .65	.00
	Stage of illness	- .37	.00
	Depression	- .51	.00
	Perceived HIV-related stigma	- .25	.00
	Physical and sexual violence since becoming HIV-infected	- .20	.00
	History of drug use since becoming HIV-infected	- .17	.00
	Age	- .25	.00

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Table 4. Backward Stepwise Selection Model for Perceived Physical Functioning.

Source	DF	SS	MS	F	p	R ²
Model	9	14475.7	1608.4	28.71	.00	.60
Error	169	9467.9	56.0			
Total	178	23943.6				

Variable	Parameter Estimate	Standard Error	SS	F	p
Intercept	70.3	7.53	4871.0	86.9	0.00
HIV-related Symptoms	-1.27	0.15	4016.2	71.69	0.00
Depression	-0.26	0.11	291.5	5.20	0.02
Hope	0.36	0.13	411.9	7.35	0.01
Present Life Satisfaction	0.12	0.06	193.6	3.46	0.06
Age	-0.31	0.09	707.5	12.63	0.00
Education	0.64	0.26	339.6	6.06	0.01
Coping-Managing the Illness	-0.40	0.18	276.6	4.94	0.03
Coping – Focusing on the Present	0.98	0.60	152.9	2.73	0.10
Coping – Positive Thinking	0.85	0.46	188.4	3.36	0.07

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