

Longitudinal Relationships Between Use of Highly Active Antiretroviral Therapy and Satisfaction With Care Among Women Living With HIV/AIDS

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In the United States, women with HIV infection are less likely than men with the disease to use various types health care services and treatments, including combination antiretroviral therapy.^{1,2} Given this disparity and the demonstrated effectiveness of highly active antiretroviral therapy (HAART) in reducing HIV morbidity and mortality,^{3,4} it is important to evaluate quality of care among women with HIV/AIDS and to examine factors that may lead to improved care and outcomes.

Satisfaction with care is variously considered to be a health outcome, a quality of care indicator, and a predictor of patient behavior. Patient satisfaction is one of the most commonly measured outcomes of patient care other than mortality and morbidity.⁵ Wu and colleagues recommended that patient satisfaction, along with measures of health status and essential care processes, be used as a quality of care indicator for adults with HIV/AIDS.⁶ In addition, there is extensive research demonstrating the association between measures of satisfaction and patient behaviors (e.g., use of primary care) and clinical outcomes.^{7–11} In all of these roles, satisfaction can be thought of as a social construct negotiated between consumers and providers of health care, as well as a necessary component of and an outcome of effective care.¹²

Although the meaning and interpretation of patient satisfaction remain a matter of debate,⁸ there is consensus that patient satisfaction is a measurable concept comprising multidimensional elements such as access to care, quality of the provider–patient interpersonal relationship, and affordability of care.^{7,8,12} Research also has established that variations in satisfaction with health care often involve patient sociodemographic or psychosocial characteristics.

For example, in a meta-analysis of more than 220 studies, Hall and Dorman found

Objectives. We used longitudinal data to examine the roles of 4 dimensions of patient satisfaction as both predictors and outcomes of use of highly active antiretroviral therapy (HAART) among women in the United States with HIV/AIDS.

Methods. Generalized estimating equations were used to analyze time-lagged satisfaction–HAART relationships over 8 years in the Women’s Interagency HIV Study.

Results. Multivariate models showed that, over time, HAART use was associated with higher patient satisfaction with care in general, with providers, and with access/convenience of care; however, patient satisfaction was not associated with subsequent HAART use. Symptoms of depression and poor health-related quality of life were associated with less satisfaction with care on all 4 dimensions assessed, whereas African American race/ethnicity, illegal drug use, and fewer primary care visits were associated with less HAART use.

Conclusions. Our findings suggest that dissatisfaction with care is not a reason for underuse of HAART among women with HIV and that providers should not be discouraged from recommending HAART to dissatisfied patients. Rather, increasing women’s access to primary care could result in both increased HAART use and greater patient satisfaction. (*Am J Public Health.* 2006;96:1044–1051. doi:10.2105/AJPH.2005.061929)

that numerous patient demographic characteristics predicted care satisfaction, including older age, low education levels, being married, and higher social status, although these relationships varied across racial/ethnic and gender groups.¹³ In a study of satisfaction with care among women with HIV/AIDS, Burke et al. found that levels of patient satisfaction varied across different dimensions of care.¹⁴ In the same study, some patient characteristics were associated with lower satisfaction across multiple dimensions of care, including the presence of depressive symptoms, poor self-reported health, lack of a regular health care provider, Hispanic/Latina race/ethnicity, and nonuse of antiretroviral therapy.

Satisfaction with care among patients with HIV/AIDS has been shown to be associated with adherence to antiretroviral therapy^{15,16} but has seldom been studied in relationship to other patient behaviors such as use of HAART. Given the ongoing importance of HIV/AIDS as a women’s health issue¹⁷ and

evidence that HAART is underused among women,^{1,18} we examined the role of satisfaction with care as both a predictor and an outcome of HAART use. Absent a randomized controlled experiment, evidence of causality is best inferred from analyses of temporal relationships, such as those revealed in longitudinal cohort data.⁴ Study of long-term temporal relationships in a prospective cohort might clarify the role of patient satisfaction as a predictor of patient behaviors as well as an outcome of care. We addressed 2 research questions: (1) Are there dimensions of patient satisfaction related to subsequent HAART use? and (2) Does HAART use influence dimensions of subsequent patient satisfaction?

METHODS

Participants

We used data from the Women’s Interagency HIV Study (WIHS), a multicenter cohort investigation designed to examine HIV

in women. Between October 1994 and November 1995, 2059 HIV-positive and 569 HIV-negative women were enrolled in the WIHS at 6 sites nationwide: Brooklyn, the Bronx, Washington, DC, Chicago, Los Angeles, and the San Francisco Bay Area.^{19,20} We focused on data from study visits, consisting of extensive in-person interviews and clinical examinations, occurring between 1994 and 2002. Because we wanted to examine relationships between patient satisfaction and use of HAART longitudinally, we included in our analyses only the 1701 HIV-infected women who had at least one WIHS study visit after HAART had become generally available (i.e., women who had a visit after April 1, 1996).

Measures

The RAND Patient Satisfaction Questionnaire, Short Form (PSQ-18),²¹ was used to annually assess patients' satisfaction with their health care. The PSQ-18 has demonstrated validity and reliability in various patient populations, including men and women with HIV/AIDS.^{14,22,23} The dimensions of satisfaction measured by this multidimensional instrument are as follows: technical quality, interpersonal manner, communication, financial aspects, time spent with provider, accessibility and convenience of care, and general satisfaction. However, the scale authors have provided evidence that technical quality, interpersonal manner, communication, and time spent with provider are substantially correlated and can be aggregated into a single subscale reflecting satisfaction with one's provider.^{21,24}

Therefore, we created 4 subscales in accordance with the PSQ-18 scoring instructions²¹; that is, we reversed negative items so that all items were scored on a scale of 1 (least satisfaction) to 5 (most satisfaction), we excluded missing items, and we averaged the available items. All 4 subscale scores were negatively skewed, with minimum and maximum values of 1 to 5, means ranging from 3.65 to 3.98, and medians ranging from 3.94 to 4.00. Across all visits, correlation coefficients among the 4 subscales ranged from 0.36 (between financial aspects of care and access/convenience of care) to 0.75 (between general satisfaction and satisfaction with provider), indicating divergent validity. We tested the

collinearity of the 4 subscales in a regression model. No subscales had common variance proportions above 0.50 on a principal component, indicating that multicollinearity would not be a significant problem in the multivariate model.²⁵

In guidelines published in 1998, the National Institutes of Health²⁶ defined HAART as involving treatment with 2 or more nucleotide reverse transcriptase inhibitors and a protease inhibitor (e.g., indinavir, saquinavir, zidovudine, or zalcitabine) or in combination with a nonnucleotide reverse transcriptase inhibitor (e.g., nevirapine or delavirdine). In this study, non-HAART combination antiretroviral therapy, monotherapy, and no therapy were all grouped into the non-HAART category.

Our choices of time-varying and fixed covariates for assessment were based on the literature on patient satisfaction and use of HAART and antiretroviral therapy among women with HIV. Sociodemographic factors assessed included race/ethnicity (African American, Hispanic/Latina, White), age at baseline (greater than the sample median age of 36 years), any employment, low income (less than \$12 000 per year), high school education, and residence in one's own home or apartment. Psychosocial factors included illegal drug use (crack, cocaine, heroin, amphetamines), probable depression (score of 16 or above on the Center for Epidemiological Studies Depression Scale²⁷), and high health-related quality of life (score above 50 on the Medical Outcomes Study HIV Instrument²⁸). Clinical factors included CD4 count below 200, detectable HIV RNA viral load, and any of 6 HIV-related symptoms (fever, memory loss, numbness, weight loss, confusion, night sweats).

Factors associated with health service delivery included type of insurance coverage (Medicaid or private); presence of a usual source of health care; receipt of care in an emergency room; out-of-pocket payments made to providers or hospitals or for prescriptions; and frequency of primary care visits. To control for possible relationships between study visit compliance and patient satisfaction or HAART use, we created a dichotomous variable intended to identify women who had completed 75% or more of all study visits versus those who had not. Study site also was

included in the multivariate analyses to control for regional variations in satisfaction and HAART use. Correlations among covariates did not exceed 0.50 and were not sufficient to introduce multicollinearity into the statistical model, especially given the high power of the analysis.²⁹

Data Analysis

Postbaseline patient satisfaction and HAART use were lagged to previous study visits so that, at each time point in the analysis, dependent variables were measured 1 study visit after independent variables and covariates, approximating a 6-month time interval. We used univariate and multivariate generalized estimating equations to test relationships between satisfaction and HAART use over time; we present the results of these tests in the form of odds ratios (ORs). Generalized estimating equation analyses do not require a balanced design (i.e., observations at all measurements for each participant), and they accommodate correlated errors due to repeated measures.³⁰ We used a binomial logit function to estimate likelihood of HAART use and a normal identity function for patient satisfaction subscales. SAS (SAS Institute Inc, Cary, NC) was used in conducting the analyses.

RESULTS

Sample Characteristics

Of the 1701 women who had at least 1 follow-up visit after April 1, 1996, 65% (n = 1110) were still active (i.e., they had completed their 15th or 16th visit) in the cohort 8 years later (Table 1). Approximately half of study attrition was due to death (48%). At baseline, women were most satisfied with the financial aspects of their care, with a mean rating of 3.85 (SD = 1.03) on the 1 to 5 scale. Mean ratings were 3.72 (SD = 0.68) for satisfaction of with providers, 3.62 (SD = 0.94) for general satisfaction, and 3.58 (SD = 0.72) for satisfaction with access/convenience of care.

Over time, mean satisfaction ratings increased slightly and evenly on all 4 subscales. Eight years after baseline, women were still most satisfied with the financial aspects of their care (mean = 4.01, SD = 0.86) and

TABLE 1—Characteristics of Women's Interagency HIV Study Sample, 1994–1995 and 2002

	Baseline (1994–1995) (n = 1701)	Visit 16 (2002) (n = 1110)
Satisfaction with medical care, ^a mean score (SD)		
General satisfaction subscale	3.62 (0.94)	3.78 (0.82)
Relationship with provider subscale	3.72 (0.68)	3.89 (0.59)
Financial aspects subscale	3.85 (1.03)	4.01 (0.86)
Accessibility and convenience subscale	3.58 (0.72)	3.73 (0.75)
Any HAART use, % (No.)	<1 (11)	63.1 (700)
Sociodemographic characteristics, % (No.)		
Race/ethnicity		
African American	55.7 (946)	56.1 (595)
Hispanic/Latina	23.9 (406)	24.7 (262)
White	18.0 (305)	16.5 (175)
Age > 36 y	47.7 (811)	44.7 (496)
Employed (full or part time)	21.8 (371)	33.5 (355)
Low income (< \$12 000/y)	63.4 (1040)	53.3 (561)
High school education or more	62.7 (1066)	64.1 (680)
Living in own home or apartment	69.0 (1171)	83.6 (885)
Psychosocial characteristics, % (No.)		
Illegal drug use	28.5 (484)	11.6 (122)
Depression	55.3 (940)	49.7 (467)
High health-related quality of life	51.6 (877)	61.4 (637)
Clinical characteristics, % (No.)		
CD4 count < 200	24.1 (397)	19.8 (204)
Detectable viral load	81.8 (1356)	63.5 (656)
Any HIV-related symptoms	50.8 (859)	45.8 (508)
Health service delivery and use, % (No.)		
Medicaid coverage	61.2 (1036)	71.5 (667)
Private insurance coverage	14.6 (248)	21.6 (214)
Usual source of health care	92.5 (1561)	92.1 (884)
Any use of emergency room	17.7 (300)	27.5 (264)
Paid for health care/prescription(s) out of pocket	19.3 (287)	29.5 (310)
No. of primary provider visits		
1–2	79.1 (1022)	33.5 (321)
3–5	16.9 (218)	33.9 (325)
≥ 6	4.0 (52)	32.6 (312)
Completed more than 75% of biannual study visits, % (No.)	64.6 (1098)	89.8 (997)

Note. HAART = highly active antiretroviral therapy. Shown are data for women who had completed at least 1 study visit after April 1, 1996. The possible score range on satisfaction subscales was 1 (lowest satisfaction) to 5 (highest satisfaction).

^aAssessed only at odd-numbered visits.

least satisfied with access/convenience (mean = 3.73, SD=0.75). Most characteristics of the sample did not change notably over time, although there were general increases in income; increases in the percentages of women who were employed, had stable housing, and had Medicaid and private insurance coverage; and improvements in clinical disease markers (i.e., CD4 count and viral load).

Patient Satisfaction and Subsequent HAART Use

Table 2 presents the results of univariate generalized estimating equation analyses of the unadjusted relationships between the 4 dimensions of patient satisfaction and subsequent use of HAART. Scores on all 4 subscales of satisfaction with care were positively and significantly ($P<.05$) associated with

subsequent HAART use; odds ratios were 1.17 for the financial satisfaction subscale, 1.23 for the general satisfaction subscale, 1.36 for the satisfaction with access/convenience subscale, and 1.40 for the satisfaction with provider subscale.

Therefore, without control for any other factors, each unit increase in satisfaction with financial aspects of care (on a 1–5 scale) was associated with an approximately 17% greater likelihood of women reporting HAART use at their next study visit. In addition, each unit increase in general satisfaction with care was associated with a 23% greater likelihood of women reporting HAART use at the next study visit, each unit increase in satisfaction with access/convenience was associated with a 36% greater likelihood, and each unit increase in satisfaction with provider was associated with a 40% greater likelihood. Almost all of the other factors tested at the univariate level also were significantly ($P<.05$) associated with later HAART use, including study time interval, sociodemographic characteristics (with the exception of age), psychosocial characteristics, clinical characteristics, health service delivery and use, and completion of 75% or more of study visits.

Table 3 shows the results of the multivariate generalized estimating equation analyses, in which none of the measures of satisfaction were associated with subsequent HAART use. The factors that remained significantly ($P<.05$) associated with later HAART use were study time interval (OR=1.23), clinical markers of HIV (i.e., CD4 count below 200 [OR=1.78] and detectable viral load [OR=1.69]), and more frequent visits with providers (3–5 visits every 6 months [OR=1.84] and 6 or more visits [OR=2.38]). Women who reported use of illegal drugs were less likely to subsequently report HAART use (OR=0.60), as were African American women (OR=0.70) and women who had an emergency room visit (OR=0.81).

HAART Use and Subsequent Patient Satisfaction

Table 2 shows that, at the univariate level, HAART use was significantly ($P<.05$) associated with higher levels of satisfaction at subsequent visits on all 4 subscales. Women reporting HAART use were more likely to

TABLE 2—Results of Univariate Generalized Estimating Equation Analyses of Temporal Relationships Between HAART Use and Satisfaction With Care: Women's Interagency HIV Study

	Subsequent HAART Use, Univariate OR (95% CI)	Subsequent Satisfaction With Care, Univariate OR (95% CI)			
		General	Provider	Financial Aspects	Access/Convenience
Time interval (visits 1–16, 1994–2002)	1.23 (1.22, 1.24)*	1.01 (1.00, 1.01)	1.01 (1.00, 1.00)	1.01 (1.00, 1.01)	1.01 (1.01, 1.02)*
General satisfaction subscale	1.23 (1.18, 1.30)*	...	...	...	...
Satisfaction with provider subscale	1.40 (1.31, 1.50)*	...	...	...	...
Financial aspects subscale	1.17 (1.12, 1.22)*	...	...	...	...
Accessibility/convenience subscale	1.36 (1.28, 1.43)*	...	...	...	...
Any HAART use	...	1.12 (1.08, 1.16)*	1.12 (1.09, 1.15)*	1.08 (1.04, 1.13)*	1.16 (1.12, 1.20)*
African American	0.72 (0.68, 0.76)*	1.03 (1.00, 1.07)	1.04 (1.01, 1.06)*	1.03 (0.99, 1.08)	1.05 (1.02, 1.09)*
Hispanic/Latina	1.22 (1.14, 1.30)*	1.00 (0.96, 1.04)	0.90 (0.87, 0.93)*	1.07 (1.02, 1.12)*	0.90 (0.87, 0.93)*
Age > 36 y at baseline	0.96 (0.91, 1.02)	1.00 (0.97, 1.04)	1.01 (0.98, 1.03)	0.98 (0.94, 1.02)	1.02 (0.99, 1.06)
Employed (full or part time)	1.34 (1.25, 1.43)*	1.10 (1.06, 1.15)*	1.13 (1.09, 1.16)*	0.89 (0.86, 0.93)*	1.15 (1.11, 1.19)*
Low income (< \$12 000/y)	0.69 (0.65, 0.74)*	0.91 (0.88, 0.95)*	0.88 (0.86, 0.91)*	1.07 (1.02, 1.11)*	0.88 (0.84, 0.90)*
High school education or more	1.18 (1.10, 1.25)*	1.04 (1.00, 1.08)	1.13 (1.10, 1.16)*	0.98 (0.94, 1.02)	1.09 (1.06, 1.13)*
Living in own home or apartment	1.72 (1.60, 1.86)*	1.03 (0.99, 1.08)	1.04 (1.01, 1.08)*	1.01 (0.96, 1.06)	1.02 (0.98, 1.06)
Illegal drug use	0.46 (0.42, 0.50)*	0.88 (0.84, 0.93)*	0.89 (0.86, 0.92)*	0.97 (0.92, 1.02)	0.89 (0.85, 0.93)*
Depression	0.75 (0.70, 0.80)*	0.76 (0.74, 0.79)*	0.79 (0.77, 0.81)*	0.88 (0.85, 0.92)*	0.80 (0.77, 0.82)*
High health-related quality of life	1.20 (1.13, 1.28)*	1.34 (1.29, 1.38)*	1.24 (1.20, 1.27)*	1.15 (1.11, 1.20)*	1.26 (1.22, 1.30)*
CD4 count < 200	1.27 (1.18, 1.36)*	0.95 (0.91, 0.99)*	0.95 (0.92, 0.98)*	0.97 (0.92, 1.01)	0.98 (0.95, 1.02)
Detectable viral load	0.64 (0.60, 0.69)*	0.90 (0.87, 0.94)*	0.93 (0.90, 0.96)*	0.96 (0.92, 1.00)	0.94 (0.91, 0.98)*
Any HIV-related symptoms	0.94 (0.88, 0.99)*	0.80 (0.77, 0.83)*	0.86 (0.84, 0.88)*	0.92 (0.89, 0.96)*	0.85 (0.82, 0.87)*
Medicaid coverage	0.85 (0.80, 0.91)*	0.93 (0.90, 0.97)*	0.91 (0.89, 0.94)*	1.12 (1.08, 1.16)*	0.93 (0.90, 0.96)*
Private insurance coverage	1.40 (1.29, 1.52)*	1.10 (1.04, 1.15)*	1.16 (1.12, 1.20)*	0.86 (0.81, 0.90)*	1.22 (1.17, 1.28)*
Usual source of health care	1.86 (1.69, 2.05)*	1.13 (1.07, 1.19)*	1.12 (1.07, 1.16)*	1.16 (1.10, 1.23)*	1.12 (1.06, 1.17)*
Any use of emergency room	0.96 (0.89, 1.03)	0.88 (0.85, 0.92)*	0.92 (0.90, 0.95)*	0.98 (0.93, 1.03)	0.94 (0.90, 0.97)*
Paid for health care out of pocket	1.31 (1.22, 1.41)*	0.95 (0.91, 0.99)*	1.05 (1.02, 1.08)*	0.80 (0.77, 0.84)*	1.03 (0.99, 1.07)
Number of primary provider visits					
1–2	Reference	Reference	Reference	Reference	Reference
3–5	1.83 (1.69, 1.98)*	1.01 (0.96, 1.06)	1.01 (0.98, 1.05)	1.02 (0.97, 1.07)	1.04 (1.00, 1.08)
≥ 6	2.03 (1.88, 2.20)*	0.98 (0.93, 1.02)	0.98 (0.95, 1.01)	1.02 (0.98, 1.08)	1.05 (1.01, 1.09)*
Completed more than 75% of study visits	1.75 (1.61, 1.90)*	1.13 (1.08, 1.19)*	1.12 (1.08, 1.16)*	1.10 (1.04, 1.15)*	1.06 (1.02, 1.11)*

Note. HAART = highly active antiretroviral therapy; OR = odds ratio; CI = confidence interval.
**P* < .05.

report higher general satisfaction with care at their subsequent study visit than women not reporting HAART use (OR = 1.12). Women using HAART were also more likely to report more satisfaction with their provider (OR = 1.12), financial aspects of their care (OR = 1.08), and access/convenience (OR = 1.16).

In addition to the positive relationship of HAART use with all 4 satisfaction subscales, women who reported better health-related quality of life, who usually saw the same provider, or who completed 75% or more of their scheduled study visits were more likely

to report higher subsequent satisfaction on all 4 subscales. In contrast, symptoms of depression and HIV-related symptoms were consistently associated with a lower likelihood of satisfaction on all 4 subscales. Other univariate relationships exhibited less consistent patterns.

At the multivariate level (Table 3), use of HAART continued to be significantly (*P* < .05) associated with a greater likelihood of subsequent general satisfaction (OR = 1.06), satisfaction with provider (OR = 1.07), and satisfaction with access/convenience (OR = 1.08),

but it was not related to satisfaction with financial aspects of care. Continuing the pattern seen in the univariate analyses, reports of higher health-related quality of life were consistently and significantly associated with higher satisfaction on all 4 subscales, whereas depressive symptomatology was consistently and significantly associated with less satisfaction on all 4 subscales.

Other sample characteristics were associated with different dimensions of satisfaction. For example, Hispanic/Latina women were more satisfied than others on the general

TABLE 3—Results of Multivariate Generalized Estimating Equation Analyses of Temporal Relationships Between HAART Use and Satisfaction With Care: Women's Interagency HIV Study

	Subsequent HAART Use, Multivariate OR (95% CI)	Subsequent Satisfaction With Care, Multivariate OR (95% CI)			
		General	Provider	Financial Aspects	Access/Convenience
Time interval (visits 1–16, 1994–2002)	1.23 (1.21, 1.25)*	1.00 (1.00, 1.01)	1.00 (1.00, 1.01)	1.01 (1.00, 1.01)	1.01 (1.00, 1.01)
General satisfaction subscale	1.06 (0.94, 1.20)	...	...	...	...
Satisfaction with provider subscale	0.98 (0.82, 1.17)	...	...	...	...
Financial aspects subscale	1.02 (0.94, 1.11)	...	...	...	...
Accessibility and convenience subscale	1.11 (0.99, 1.24)	...	...	...	...
Any HAART use	...	1.06 (1.01, 1.12)*	1.07 (1.03, 1.12)*	1.03 (0.97, 1.09)	1.08 (1.03, 1.14)*
African American	0.70 (0.56, 0.89)*	1.08 (0.98, 1.18)	0.99 (0.93, 1.06)	1.04 (0.95, 1.14)	1.03 (0.96, 1.12)
Hispanic/Latina	0.78 (0.58, 1.03)	1.12 (1.01, 1.24)*	0.96 (0.89, 1.03)	1.09 (0.98, 1.22)	0.98 (0.90, 1.07)
Age > 36 y at baseline	1.03 (0.87, 1.22)	1.04 (0.98, 1.10)	1.03 (0.99, 1.08)	0.99 (0.93, 1.05)	1.04 (0.98, 1.10)
Employed (full or part time)	1.03 (0.86, 1.24)	0.96 (0.90, 1.02)	0.96 (0.92, 1.01)	0.92 (0.86, 0.98)*	0.99 (0.93, 1.05)
Low income (< \$12 000/y)	0.89 (0.77, 1.04)	0.94 (0.89, 0.99)*	0.94 (0.90, 0.98)*	0.99 (0.94, 1.05)	0.94 (0.89, 0.98)
High school education or more	1.08 (0.91, 1.29)	1.01 (0.95, 1.08)	1.06 (1.01, 1.12)*	1.03 (0.97, 1.10)	1.02 (0.96, 1.08)
Living in own home or apartment	1.14 (0.95, 1.36)	1.00 (0.94, 1.07)	1.01 (0.96, 1.06)	1.02 (0.96, 1.10)	0.98 (0.92, 1.04)
Illegal drug use	0.60 (0.49, 0.75)*	0.97 (0.90, 1.04)	0.98 (0.92, 1.03)	1.00 (0.93, 1.07)	0.98 (0.91, 1.05)
Depression	0.89 (0.76, 1.04)	0.86 (0.81, 0.91)*	0.87 (0.83, 0.90)*	0.91 (0.86, 0.96)*	0.89 (0.84, 0.94)*
High health-related quality of life	1.00 (0.85, 1.18)	1.18 (1.11, 1.25)*	1.10 (1.06, 1.15)*	1.15 (1.08, 1.22)*	1.13 (1.07, 1.19)*
CD4 count < 200	1.78 (1.50, 2.10)*	1.02 (0.96, 1.08)	0.99 (0.95, 1.04)	0.99 (0.93, 1.06)	1.04 (0.98, 1.10)
Detectable viral load	1.69 (1.44, 1.98)*	0.96 (0.91, 1.01)	0.98 (0.95, 1.02)	0.98 (0.93, 1.03)	0.98 (0.94, 1.02)
Any HIV-related symptoms	1.06 (0.92, 1.22)	0.90 (0.86, 0.95)*	0.94 (0.90, 0.97)*	0.98 (0.93, 1.03)	0.92 (0.88, 0.96)
Medicaid coverage	0.88 (0.72, 1.07)	1.00 (0.92, 1.07)	0.99 (0.93, 1.04)	1.09 (1.01, 1.17)*	1.08 (1.01, 1.16)*
Private insurance coverage	1.06 (0.79, 1.42)	0.97 (0.87, 1.09)	0.97 (0.89, 1.05)	0.90 (0.80, 1.01)	1.11 (1.01, 1.22)*
Usual source of health care	1.20 (0.93, 1.54)	1.17 (1.07, 1.27)*	1.09 (1.02, 1.16)*	1.07 (0.98, 1.18)	1.07 (0.99, 1.15)
Any use of emergency room	0.81 (0.69, 0.94)*	0.98 (0.93, 1.04)	0.98 (0.94, 1.02)	1.00 (0.95, 1.06)	0.98 (0.93, 1.03)
Paid for health care out of pocket	0.90 (0.76, 1.07)	0.93 (0.87, 0.99)*	0.99 (0.94, 1.03)	0.85 (0.79, 0.91)*	0.96 (0.91, 1.02)
Number of nonstudy provider visits					
1–2	Reference	Reference	Reference	Reference	Reference
3–5	1.84 (1.58, 2.14)*	1.05 (0.99, 1.10)	1.04 (1.00, 1.08)	1.05 (0.99, 1.11)	1.06 (1.01, 1.11)*
≥ 6	2.38 (2.00, 2.84)*	1.06 (1.00, 1.13)	1.05 (1.01, 1.10)*	1.07 (1.01, 1.14)*	1.12 (1.06, 1.19)*
Completed more than 75% of study visits	0.96 (0.79, 1.17)	1.07 (0.99, 1.16)	1.07 (1.01, 1.14)*	1.05 (0.98, 1.14)	1.02 (0.96, 1.10)

Note. HAART = highly active antiretroviral therapy; OR = odds ratio; CI = confidence interval. Multivariate models included control variables for study site. **P* < .05.

measure of care (OR=1.12), as were those usually seeing the same provider (OR=1.17); lower-income women were less satisfied on this dimension (OR=0.94). Women were more likely to be satisfied with their provider if they had more education (OR=1.06), usually saw the same provider (OR=1.09), or had completed most of their study visits (OR=1.07), whereas women with very low incomes (OR=0.94) or HIV-related symptoms (OR=0.94) were less satisfied on this dimension. Less satisfaction with financial aspects of care was associated with paying out

of pocket for care (OR=0.85) and with being employed (OR=0.92); women with Medicaid coverage were more likely to be satisfied with the financial aspects of their care (OR=1.09).

Finally, women who had Medicaid or private insurance coverage and those who visited their providers 3 to 5 times or 6 or more times every 6 months were more likely to later report higher satisfaction with access/convenience of care (ORs=1.08, 1.11, 1.06, and 1.12, respectively). Factors that were not significantly associated with subsequent satisfaction with care on any dimension in the

multivariate analyses included passage of time, African American race/ethnicity, reported use of illegal drugs, age, housing stability, CD4 count and viral load, and use of an emergency room for care.

DISCUSSION

We found that women's satisfaction with 4 dimensions of their health care was not significantly associated with their later use of HAART but that women using HAART were significantly more likely than others to

subsequently report higher levels of satisfaction on 3 different aspects of care. Women's health and other characteristics were more important predictors of HAART use than their satisfaction with various aspects of care. In addition, varying relationships were observed between satisfaction on the 4 dimensions of care assessed (general, provider, financial aspects, and access/convenience) and a number of different characteristics of the participants. Most notably, high levels of depressive symptoms were associated with less satisfaction on all 4 dimensions of care, whereas higher health-related quality of life was associated with more satisfaction on all 4 dimensions. In contrast, demographic, clinical, and health service characteristics were differentially associated with dimensions of care, supporting the discriminant validity of the dimensional subscales.

Our findings suggest that the relatively low rate of HAART use observed (less than 67%) may not be the result of women being dissatisfied with their care and, as a consequence, rejecting effective therapies. Women who were less satisfied with their care on 4 different dimensions were as likely to report later HAART use as were women who were highly satisfied with their care. Rather, use of HAART was associated with patients' demographic and psychosocial characteristics, their previous health status, and their previous use of other health services. These findings are in keeping with the predisposing, need, and enabling components of the behavioral model of HIV health service use described by Anderson and colleagues.³¹ According to this model, need variables (CD4 count and viral load) are predictive of HAART use, as are predisposing and enabling variables related to patient characteristics (race/ethnicity, drug use) and health care delivery characteristics (more frequent visits, no emergency room use).

The finding that African American women were less likely to report HAART use than White women is consistent with the patterns of poorer quality of HIV care observed among members of racial/ethnic minority groups in other studies, including those involving large patient databases and nationally representative data.^{2,31,32} Similarly, the finding that women who reported use of illicit drugs

such as crack, cocaine, heroin, or amphetamines were less likely than women who did not to report subsequent HAART use replicates the findings of other studies^{33,34}; this disparity has been hypothesized to be the result of providers withholding HAART from active drug users owing to concerns about adherence or other issues.³⁵ For example, a survey of more than 900 US infectious disease physicians treating HIV patients revealed that although most physicians follow guidelines for the prescription of HAART, nonmedical factors related to patients' life situations (e.g., adherence history, homelessness, alcohol and drug use, previous psychiatric hospitalizations) are as important as disease severity in treatment decisions.³⁶

We did not find that type of insurance coverage was significantly related to HAART use, perhaps because the majority of women taking part in the WIHS received care under Medicaid programs. However, other characteristics of health service use were associated with subsequent use of HAART, including completing more provider visits and not using an emergency room for care. Accessibility is one of the components of primary care suggested to be an important determinant of quality of care and outcomes among patients with HIV,³⁷ and it may be a precursor to other essential processes of care such as pharmacotherapy and referrals to specialty services.

As mentioned, we found that use of HAART was significantly associated with subsequent patient satisfaction on 3 distinct dimensions: general satisfaction, satisfaction with provider, and satisfaction with access/convenience. It would appear that, despite the many difficulties associated with the complexity and side effects of HAART regimens, women using HAART were later more satisfied with their care than those not using HAART. This finding also raises the possibility that improved health status stemming from use of HAART may result in greater satisfaction with care among women with HIV/AIDS.

In addition, women who saw the same provider for their care and who had more visits with their providers reported higher subsequent satisfaction with their providers. The latter relationship was also related to use of

HAART in this cohort, suggesting that more frequent primary care visits are significant in terms of both patients' satisfaction and their use of the most potent and effective forms of antiretroviral therapy. Given an association between higher quality primary care and HIV patient outcomes,³⁷ frequency or intensity of outpatient care could be argued to be an important indicator of HIV care quality as well as a predictor of both patient satisfaction and HAART use. The finding that HAART use was not related to subsequent satisfaction with financial aspects of care again may be related to the majority of the women being covered by Medicaid.

In general, factors consistently associated with higher patient satisfaction on multiple dimensions have to do with patients' mental health status and health-related quality of life, which are themselves moderately correlated. Regardless of HAART use, women with high levels of depressive symptoms were less satisfied on all 4 dimensions, whereas those who perceived their health-related quality of life as good were more satisfied on all 4 dimensions. These findings are in keeping with the results of other studies involving HIV patients that have shown better mental health status and health-related quality of life to be associated with better ratings of care and patient-provider relationships.^{38,39}

Previous studies of HIV/AIDS also have shown that depression is associated with perceived poor health status and that both depression and poor health status are associated with dissatisfaction with medical care.^{14,40} In addition, depression has been shown to be highly prevalent among women with HIV/AIDS and to be associated with underuse of HAART.^{41,42,43} It may be that patients with poorer health-related quality of life and more depressive symptoms have more complex care needs, and researchers in this area have stated the need for better patient-provider communication as a means of improving HIV patients' care experiences,^{38,39} as well as the need for increased awareness of potential mental health problems and access to mental health services.^{14,41}

This study involved a number of limitations, and its results must be interpreted with caution. For example, although the WIHS includes a large, multisite cohort, the results are

not necessarily generalizable to all women in the United States with HIV/AIDS. In addition, patient satisfaction was measured annually rather than biannually during the study period, limiting opportunities to observe change. Also, although we had data on numbers of health care encounters, we lacked data on the quality of care provided; women in the non-HAART group may have been receiving appropriate combination or other therapies that were not identified as such. Moreover, we did not have information on the demographic characteristics of providers, their HIV expertise, or their levels of satisfaction with their patients and their own caregiving, nor were we able to determine whether the women in this study were constrained in their choice of providers and frequency of provider visits.

The results of this study have practical implications for improving medical care among women with HIV/AIDS. First, quality of care and outcomes of care can be informed through multidimensional assessments of women's satisfaction with their care. Second, health insurance coverage, in particular Medicaid coverage, is important in terms of ensuring access to care among women with HIV/AIDS. Public policies that maintain or expand public and private health care coverage in this population should be supported.

Third, as noted by others, efforts are still needed to increase women's use of primary HIV care.^{1,2,44} Increasing use of such care as well as HAART use may enhance opportunities for women and their providers to address co-occurring problems (e.g., depression and social service needs) as women become more satisfied with their care. Greater accessibility and frequency of care also could encourage use of HAART, thus improving patient satisfaction. Finally, in keeping with recent recommendations of the HIV Medicine Association of the Infectious Diseases Society of America, all women treated for HIV should be screened for depression and other mental health problems.⁴⁵ ■

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Contributors

J.K. Burke-Miller originated the study, conducted the analyses, and led the writing. J.A. Cook contributed to the writing. All of the authors helped to conceptualize ideas, interpret findings, and review drafts of the article.

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Human Participant Protection

We obtained informed consent from the participants in accordance with procedures and consent materials reviewed and approved by the committee on human experimentation of each collaborative institution.

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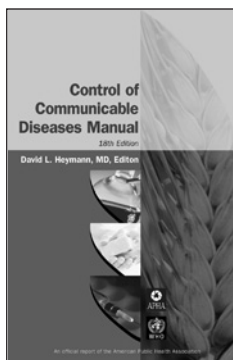
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