Symptom Burden of Fatigue in Men and Women Living With HIV/AIDS in Southern Africa

Joachim G. Voss, PhD, RN
Nonhlanhla A. Sukati, PhD, RN
Naomi M. Seboni, PhD, RN
Lucy N. Makoae, PhD, RN
Mary Moleko, MA, RN
Sarie Human, PhD, RN
Kgoroletso Molosiwa, MPH, RN
William L. Holzemer, PhD, RN, FAAN

HIV-related fatigue is a debilitating and disabling symptom that persists for months and years. In 743 HIV/AIDS patients from Southern Africa, the authors found ratings of HIV-related fatigue to be highly prevalent. The authors conducted a secondary data analysis within the theoretical context of the University of California, San Francisco Symptom Management Model. The analysis focused on 538 patients who reported fatigue to investigate correlates and predictors of fatigue severity in relationship to demographic and HIV/AIDS illness indicators, as well as HIV-specific physical and psychological symptoms. A hierarchical regression model explored the contributions of those five blocks on fatigue severity. Of the 47% of the total variance in fatigue severity, a combination of variables within the health and illness block (6%), the physical symptoms block (7%) and the psychological symptom block (2%) contributed significantly to the increase in fatigue severity scores. Fatigue severity in Southern Africa was moderate, and the factors contributing to the perceived fatigue were most likely related to symptoms of acute HIV disease (such as fever and gastrointestinal problems). In conclusion, fatigue severity is less impacted by demographic or environmental variables but much more by co-occurring symptoms and HIV disease severity. The results of this study imply the need for more research to understand if improvements in water quality and access to food would prevent infection and diarrhea and whether sufficient access to antiretroviral treatments to manage the HIV infection would improve fatigue and co-occurring symptom profiles.

Key words: *HIV/AIDS, fatigue, Southern Africa, symptoms*

Fatigue is a highly prevalent symptom among people living with HIV/AIDS in developed countries (Barroso, Carlson, & Meynell, 2003). It is well documented that up to 85% of HIV/AIDS patients complain about periodic or persistent moderate to severe tiredness and exhaustion (Voss, 2005). HIV/AIDS-related fatigue has been defined as extended perception of tiredness and exhaustion that persists for longer than one month, which is not relieved by additional sleep or rest (Piper, 1998). The causes of

Joachim G. Voss, PhD, RN, is an assistant professor at the University of Washington. Nonhlanhla A. Sukati, PhD, RN, is at the University of Swaziland, Faculty of Health Sciences, Mbabane. Naomi M. Seboni, PhD, RN, is in the Department of Nursing at the University of Botswana, Gaborone. Lucy N. Makoae, PhD, RN, is at the National University of Lesotho. Mary Moleko, MA, RN, is at the Democratic Nursing Organization of South Africa, Natal. Sarie Human, PhD, RN, is in advanced nursing science at the University of South Africa, Pretoria. Kgoroletso Molosiwa, MPH, RN, is at the AIDS/sexually transmitted disease unit, Gaborone, Botswana. William L. Holzemer, PhD, RN, FAAN, is a professor and associate dean for international programs at the School of Nursing, University of California, San Francisco.

JOURNAL OF THE ASSOCIATION OF NURSES IN AIDS CARE, Vol. 18, No. 4, July/August 2007, 22-31
doi:10.1016/j.jana.2007.05.001

fatigue in HIV disease are multifactorial and include changes in hematological, immunological, endocrine, circadian, psychological, and mitochondrial functions (Butensky, Kennedy, Lee, Harmatz, & Miaskowski, 2004; Cohen, Ferrans, Vizgirda, Kunkle, & Cloninger, 1996; Elenkov et al., 2005; Fiala et al., 2004; Hengge, 2003; Perkins et al., 1995).

The body of literature on HIV/AIDS-related symptom profiles and symptom management research in Africa is very limited compared with the United States and Europe. Searching PubMed resulted in three publications on symptom frequency and intensity and symptom management in African HIV/AIDS patients. The first article described a study conducted with terminally ill AIDS patients in Soweto, South Africa ($n = 103$) (Norval, 2004). The mean age of these hospice patients was 35.4 years, and women were on average 4.4 years younger than men. The 10 most common symptoms were pain (98%), weight loss (81%), loss of appetite (70.9%), low mood (69.9%), weakness (66%), dry skin (56.3%), diarrhea (53.4%), nausea and vomiting (44.7%), cough (44.7%), and fatigue (42.7%). Study two drew a random sample of homebound hospice patients and had results similar to the first study. Most frequently experienced were pain (89%), fungal infection (81%), forgetfulness (75%), skin problems (72%), fatigue (65%), cough (58%), fever (58%), dizziness (58%), generalized aches and pains (55%), nausea (55%), and difficulty sleeping (55%). The third study was the original study that provided the data set for this secondary analysis. This was a multicenter, multicountry (Botswana, Lesotho, South Africa, Swaziland) outpatient population study and included men and women at all stages of their HIV/AIDS illness ($n = 743$). The mean age was 34.5 years, and the 10 most frequent symptoms included fatigue (55%), weakness (53.8%), concern of weight loss (47.9%), fear and worries (45.4%), coughing (45.2%), painful joints (45.1%), lack of appetite (44%), headache (42%), muscle aches (42%), night sweats (40.6%), and depression (40.2%) (Phaladze et al., 2005). These studies suggest that pain is the most common symptom in the terminal phase of life, whereas fatigue is the most bothersome symptom for patients throughout their HIV disease process. The authors' purpose for this study was to describe variables that contribute to the differences in fatigue severity and identify predictors and correlates with regard to demographic, HIV disease, and symptom variables.

Methods

The original symptom management study for this secondary analysis was conducted in 2002. In collaboration between members of the School of Nursing at the University of California, San Francisco, and faculty members of the Schools of Nursing at the University of Botswana, the National University of Lesotho, the University of South Africa, and the University of Swaziland (Phaladze et al., 2005; Sukati et al., 2005), patients in rural, suburban, and urban areas were asked to complete a questionnaire booklet. After institutional review board approval was obtained by the local universities, a descriptive community-based survey included a total of 743 men and women with HIV/AIDS in the four countries of Botswana, Lesotho, the Republic of South Africa, and Swaziland. A convenient sampling method was chosen to include patients from diverse rural and urban outpatient clinics and hospitals and recipients of home care. Because of the extensive stigma that exists in Southern Africa against HIV/AIDS patients, the authors chose to rely on self-report measures and did not ask for clinical confirmation of patients' HIV diagnosis, CD4+ T cell counts, or viral loads. During the time of the study, fewer than 1% of the participants received antiretroviral medications, and the authors were unable to assess type and duration of treatment. To qualify for the study protocol, every participant needed to be previously diagnosed as HIV-infected by a health care provider. Participants needed to be 18 years or older, willing to participate in the study, able to provide informed consent, and have at least one symptom during the last week. The survey booklet was translated into seven participants' native languages including Sesotho, Setswana, Siswati, Tswana, Venda, Xhosa, and Zulu. The survey was administered in the local language of the participants, and the results were translated back into English by the local research team.

Instruments

A complete description of the original list of instruments can be found in a previous publication (Phaladze et al., 2005). The scales relevant to this study will be discussed in detail. The study questionnaire included two parts: a demographic data sheet and the revised Signs and Symptom Checklist-HIV (SSC-HIVrev), a validated and reliable symptom assessment scale for HIV/AIDS-related symptoms (Holzemer, Hudson, Kirksey, Hamilton, & Bakken, 2001).

1. The demographic data sheet included questions about gender, age, country, education, income, health care coverage, presence of children, knowledge of a given AIDS diagnosis, known comorbidities, number of home care visits, average time spent in bed, and the number of hospitalizations within the last 12 months. Most items included a *yes/no* or *don't know* answer or actual numbers for age, number of children, number of home care visits, or average time spend in bed.
2. The SSC-HIVrev is a 72-item checklist of HIV/AIDS-specific physical and psychological symptoms and includes eight gynecological symptoms not relevant to men. Therefore, the analysis was done on the 64 physical and psychological symptoms. Each item represents one symptom, which can be rated on an ordinal, three-point Likert scale (1 [*mild*], 2 [*moderate*], 3 [*severe*]) to measure symptom severity and frequency for the present day. If the symptom was not present, then it should have been left blank and the item was not part of the analysis. The checklist has been validated in the United States, Taiwan, and Europe, and validation studies identified that 44 of the single-item symptoms cluster into 11 symptom groups including numbness, fear, gastrointestinal upset, bruising/bleeding, headache, sore throat, rectal itch, shortness of breath, fever, body changes, and fatigue. The symptom cluster of fatigue includes four items of weakness, fatigue, muscle aches, and painful joints. These four symptoms are grouped into one summary score ranging from 0 to 12, where a higher score means higher symptom severity (Holzemer et al., 2001).

Data Analysis

For data analysis, the authors used the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL) version 12.0. Descriptive statistics evaluated demographic information and significant differences between mean fatigue severity scores, and demographic variables were established by *t*-tests and analyses of variance (ANOVAs). The variables significant in the correlation matrix or by *t*-tests or ANOVAs at a p value of less than .05 were entered blockwise into a hierarchical multiple regression model. In a hierarchical multiple regression model, the researcher decides not only how many predictors to enter, but also the order in which they are entered. The order is usually based upon logical or theoretical considerations. The variables entered were conceptualized according to the concepts of the University of California, San Francisco, Symptom Management Model (UCSF-SSM) (Dodd et al., 2001). The UCSF-SMM is a multidimensional interdependent—symptom experience—symptom management—symptom outcomes model embedded within the three nursing domains: person, the environment, and health and illness (for review see Voss, Dodd, Portillo, & Holzemer, 2006). According to the UCSF-SMM, the proposed blocks and variables entered were (a) person variables (age, presence of children), (b) environmental variables (ethnicity, income), (c) health and illness variables (present AIDS diagnosis, receives home care visits, more than 80% of the day spent in bed, number of hospitalizations within 12 months), (d) symptom experience of physical symptoms (fever, gastrointestinal symptoms, shortness of breath, numbness, headache, and body changes) and (e) symptom experience of psychological symptoms (depression).

Results

Demographics

Of the men and women with HIV/AIDS-related fatigue ($n = 538$) (see Table 1), the majority (60%) were women, and the male to female ratio in the study reflected current infection rates in Southern Africa (Norval, 2004). More than half of the participants were from South Africa, because the country is much larger than the other participating countries. Men were on average 2.7 years older (35.5 ± 9.8) than women (32.8 ± 8.8, range 9-86, $p < .001$). Mean years of education did not differ significantly between men (7.2) and women (7.7). The majority of the sample was income-poor and stated that they did not make enough income for daily needs; only 10% of the participants earned sufficient income. Only 13% reported any form of health care coverage, and more than half of the participants (71%) reported having children.

HIV/AIDS Illness

Of the study participants with HIV/AIDS-related fatigue ($n = 538$), 31% were aware of their AIDS diagnosis. Fewer than 1% had access to regular CD4 monitoring, and 15% stated that their viral load was measured in the past at least once. Besides HIV/AIDS illness, 32% reported having other medical conditions, which were not further specified in the questionnaire. The majority of study participants (66%) received regular home care visits from health care workers or nurses, but only 13% spent more than 80% of their day in bed. Half of the sample (50%) was hospitalized at least once within the last 12 months (see Table 1), which is current health care practice in Southern African countries to guarantee availability of treatment and observation of progress.

Symptom Burden

Fatigue was the most frequently rated symptom, 55% ($n = 406$), of the 64 physical and psychological symptoms in the SSC-HIVrev. The symptoms closely associated with fatigue were weakness, 54%

Table 1. Demographics and Illness Indicators by Gender ($n = 538$)

Variable	Female	Male	Chi-Square	p
Gender	321	217		
Age	32.8	35.5		<.001
Mean years of education	7.7	7.2		NS
Swaziland	55	47		<.001
Lesotho	34	30		
Botswana	31	25		
Republic of South Africa	201	115		
Enough income	26	30	4.55	<.033
Not enough income	295	187		
Health care coverage				
No coverage	290	181		NS
Enough	8	12		
Barely enough	8	9		
Inadequate	15	15		
Presence of children				
Yes	249	133	16.68	<.001
No	72	84		
AIDS diagnosis				
Don't know	225	135		NS
Yes	84	69		
No	12	13		
CD4 count				
Don't know	309	206		NS
Yes	6	6		
No	8	3		
Viral load				
Don't know	209	150		NS
Yes	45	30		
No	67	37		
Recipient of home care				
Yes	214	144		NS
No	107	73		
More than 80% of time in bed				
Yes	36	33		NS
No	285	184		
Hospitalization in the last 12 months				
Yes	159	112		NS
No	162	105		

NOTE: NS = nonsignificant. p-value significant at < .01.

Table 2. Fatigue Intensity Scores by Personal Characteristics (n = 538)

Variable	*N*	Mean	*SD*	Test of Significance (*t* or *F*-Test)	*df*	*p*
Gender Male	217	5.5 2	3.27	$t = -1.370$	536	.171
Female	321	5.1 3	3.05			
Age 9-29	60	5.56	3.31	$F = .264$	2,534	< .768
30-49	382	5.26	3.18			
50-90	96	5.29	3.16			
Country				$F = 4.597$	3,530	< .003
Botswana	64	5.00	2.83			
Lesotho	102	5.25	3.07			
South Africa		5.00	2.97			
Swaziland		6.25	3.73			
Years of education				$F = 7.114$	2,513	< .001
0-7	223	5.91	3.30			
8-12	271	4.87	3.03			
13-24	22	4.63	3.30			
Adequate income				$t = -3.185$	536	< .02
Yes	56	4.01	2.65			
No	482	5.43	3.21			
Adequate health care insurance				$F = 5.143$	2,508	< .006
Enough	56	4.01	2.65			
Barley Enough	37	5.27	2.94			
Inadequate	418	5.46	3.19			
Children				$t = 1.987$	536	< .047
Yes	382	5.46	3.24			
No	156	4.86	2.98			

NOTE: *df* = degree of freedom. Participants from Swaziland, with an education level between 0-7 years, with no adequate income, with inadequate health insurance, and with children had significantly higher fatigue severity compared with other group members. *p*-value significant at < .01.

(n = 395), painful joints, 45.1% (n = 330), and muscle aches, 41% (n = 304). Other frequently experienced symptoms were fear/worries, 44% (n = 334), lack of appetite, 44% (n = 327), headaches, 42% (n = 312), night sweats, 40% (n = 298), depression, 40% (n = 293), dry mouth, 35% (n = 257), thirst, 34% (249), and fever, 32% (n = 235).

The mean intensity score for fatigue was moderate (5.3 ± 3.2), and African men had slightly higher fatigue scores than the women (5.8 vs. 5.0); however, the difference was not statistically significant (t = −1.4, p = nonsignificant [NS]). Fatigue scores from 0 to 4 were considered mild, 5 to 8 moderate, and 9 to 12 severe. Higher fatigue intensity correlated with the variables presented in Table 2. Men and women who were older than 50 years of age, study participants from Swaziland, individuals with less than 8 years of education, those who had children, and those with insufficient income had the highest fatigue ratings among all participants. Furthermore, advanced HIV disease significantly contributed to higher fatigue intensity indicated by an AIDS diagnosis, receiving regular home care visits, the time a participant stayed in bed, and the number of hospitalizations during the last 12 months. Fatigue intensity was not related to adequacy of health insurance or the presence of comorbidities (t = .54, p < .58), access to CD4 monitoring (F = 3.1, p = NS), or viral load monitoring (F = 1.79, p = NS)

Predictors of Fatigue in a Hierarchical Regression Model

Fatigue is a complex multicausal symptom, and to determine the final selection of independent predictors of fatigue severity for patients in Southern Africa, the SSC-HIVrev fatigue score and 17 variables were correlated (see Table 3). According to the

Table 3. Fatigue Scores by Self-Reported Severity of Illness Variable (n = 538)

Variable	*N*	Mean	*SD*	Test of Significance (*t*- or *F*-Test)	*df*	*p*
Present AIDS diagnosis				$F = 12.237$	2,519	$< .001$[a]
Yes	153	5.69	3.34			
No	25	7.88	3.07			
Don't know	344	4.91	3.03			
CD4 monitoring				$F = 3.066$	2,218	.49
Yes	14	3.92	2.05			
No	9	7.33	4.09			
Don't know	198	5.63	3.32			
Viral load monitoring				$F = 1.799$	2,521	.167
Yes	75	4.84	2.82			
No	104	5.74	3.126			
Don't know	345	5.26	3.3			
Secondary diagnosis				$t = 1.453$	518	.147
Yes	169	5.60	3.22			
No	351	5.17	3.16			
Home care visits				$t = 3.319$	527	$< .001$[a]
Yes	180	5.93	3.25			
No	349	4.97	3.13			
More than 80% of time in bed				$t = 4.357$	529	$< .001$[a]
Yes	69	6.84	3.15			
No	462	5.07	3.14			
Hospitalization within the last 12 months				$t = 7.037$	505	$< .001$[a]
Yes	271	6.20	3.46			
No	236	4.28	2.52			

NOTE: *df* = degree of freedom. Mean fatigue score for participants with no AIDS diagnosis was higher than for those with a confirmed AIDS diagnosis and lowest for those who did not know their status. Fatigue scores between the participants who had access to CD4 monitoring were not significantly different from the ones who did not know whether this test was ever performed or did not have access. Participants who had regular home care visits, spent more than 80% of their time in bed during the day, and were hospitalized within the last 12 months experienced higher fatigue severity compared with other group members. Patients with secondary diagnosis did not differ from those without in regard to their fatigue severity scores.

a. *p*-value significant at $< .01$.

correlation matrix, a five-block hierarchical regression model was selected (see Table 4). Each block represented one concept of the UCSF Symptom Management Model (for review please see Dodd et. al., 2001). Block 1 included personal factors in the analysis such as age and number of children. Block 2 represented environment including income and ethnicity. Block 3 encompassed health and illness factors such as present AIDS diagnosis, home care recipient, time spent in bed, and number of hospitalizations within 12 months. Block 4 represented symptom perception of physical symptoms and included SSC-HIVrev physical symptom factor scores of fever, gastrointestinal symptoms, shortness of breath, sore throat, numbness, headache, and body change. Finally, the fifth block represented symptom perception of psychological symptoms of the SSC-HIVrev depression factor score (depression, anxiety, difficulties concentrating, and memory loss) (see Table 4). The five blocks together explained 47% of the total variance in fatigue severity of men and women with HIV/AIDS. Personal and environmental variables did not explain any individual variance in the total model (see Table 5). Individual predictors that explained a partial variance above and beyond the variables within an individual block while holding all other variables constant were AIDS diagnosis, 4%; num-

Table 4. Correlation Matrix of Fatigue Severity Score by Significant Demographic, Illness Severity and Symptom Variables

	Pearson Correlation	*p*
Demographic		
Age in years	.120	.005[a]
Years of education	−.224	.000[a]
Income	.135	.002[a]
Children	.092	.003[a]
Illness Severity		
AIDS diagnosis	.199	.000[a]
Home care visits	.143	.001[a]
Time spent in bed	.186	.000[a]
Hospital visits	.212	.028[a]
Physical Symptoms		
Fever	.499	.000[a]
Gastrointestinal upset	.477	.000[a]
Shortness of breath	.402	.000[a]
Sore throat	.388	.000[a]
Numbness	.422	.000[a]
Headache	.489	.000[a]
Body changes	.307	.000[a]
Psychological Symptoms		
Depression	.478	.000[a]
Anxiety	.450	.000[a]

a. *p*-value significant at $p < .01$.

ber of hospitalizations, 2%; number of hospitalizations, 1%; severity of fever symptoms, 3%; severity of gastrointestinal symptoms, 2%; severity of numbness, 2%; and the severity of depressive symptoms, 4%.

Discussion

Patients in this sample showed a high prevalence of fatigue and high numbers of hospitalizations, and many received home care, which is a hallmark for progressive HIV disease, yet only 13% spent more that 80% of the day in bed. Patients experienced higher fatigue severity because of higher acuity of physical and psychological symptoms such as fever, gastrointestinal symptoms, and depressive symptoms, but a secondary diagnosis did not contribute to more fatigue severity. Experiences of weakness, painful joints, and muscle aches were the most frequent fatigue-related symptoms in this study. As correlates and predictors of fatigue severity, the presence of an AIDS diagnosis, the number of hospitalizations, and a cluster of symptoms (fever symptoms, gastrointestinal symptoms, numbness symptoms, and depressive symptoms) were identified by the authors as most important.

These results have several implications for health care professionals trying to treat HIV/AIDS patients and their families in mostly resource-poor settings in Southern Africa. Symptoms do not occur in isolation but in clusters, and although increasing efforts to manage fatigue is important, so is simultaneously improving symptom assessment, symptom management, and symptom outcomes for the clusters of other symptoms that are present. To better document symptom assessment, patients need to be evaluated for the most prevalent symptoms during every visit by their health care professionals. A symptom checklist (Holzemer et al., 2001) or a symptom diary (Borthwick, Knowles, McNamara, Dea, & Stroner, 2003) could be a very helpful tool for short- or long-term assessment of HIV-related symptoms including fatigue. Severity and frequency of fatigue and other symptoms need to be recorded regularly by the patient to detect patterns of daily and weekly fluctuations. Behavioral, cognitive, or emotional changes (Barroso & Lynn, 2002) need to be assessed to prevent the onset of or manage depressive and anxiety symptoms.

In resource-poor settings, symptoms including fatigue, pain, fever, and gastrointestinal symptoms are still the most important indicators for health care professionals to diagnose developing opportunistic infections, neoplasms, and infectious diseases (Grant & De Mock, 2001). Education for health professionals in Southern Africa needs to include expert skills training in clinical observation, communication, and patient education to assist patients in effective symptom and disease management, basic hygiene, and water purification methods.

Relationships between fatigue and lean muscle loss in HIV patients have been identified early in the HIV epidemic in the United States and Europe (Parisien, Gelinas, & Cossette, 1993). The authors learned that loss of nutrients because of diarrhea and lack of appetite as well as elevated resting energy expenditure in HIV-infected men and women contribute to loss of total weight and lean muscle mass

Table 5. Hierarchical Regression Model Predicting Fatigue Severity

	N	R^2	R^2 Change	*B*	sr^2	*df*	*F*	*p*
Overall	538	.47						
Person			.019			2,535		
Age				.026	.00		5.14	.024
Children				−.112	.00		.22	.636
Environment			.023			2,533		
Income				−.665	.00		3.79	.052
Ethnicity				−.178	.00		.24	.618
Health and Illness			.131			4,529		
AIDS diagnosis				.998	.04		24.98	.000[a]
Home care				.436	.00		3.75	.053
Time in bed				.627	.00		3.57	.059
Number of hospitalizations				1.030	.02		21.97	.000[a]
Physical Symptoms			.291			7,522		
Fever				.182	.03		16.31	.000[a]
Gastrointestinal Symptoms				.134	.02		11.78	.001[a]
Shortness of breath				.007	.00		.01	.910
Sore throat				.072	.00		3.07	.080
Numbness				.138	.02		13.98	.000[a]
Headaches				.085	.00		2.70	.100
Body changes				.058	.00		1.06	.314
Psychological Symptom			.022	.197	.04	1,521	21.86	.000[a]
Depression								

NOTE: *df* = degree of freedom, *F* = significance of variable within the model, R^2 = correlation coefficient, R^2 change when the block of variables was added last, and coefficients and significance of the predictor when the set was added last, *B* = slope, sr^2 = individual contribution of that variable to the overall correlation.
a. *p*-value significant at < .01.

(Salomon, de Truchis, & Melchior, 2002). Strategies to effectively manage HIV-related fatigue in resource-poor settings should include consumption of protein-rich nutrition and clean water to prevent weight and muscle mass loss and prevent diarrhea (Evans, 2004). Previous evidence established that the combination of intake of protein-rich food sources and sufficient hydration along with increased absorption and digestion of the nutrients will contribute to the stabilization of body weight and recovery of muscle mass and body weight (Villamor et al., 2005).

Moderate exercise in the form of walks or resistance exercises should be a part of the daily routine for patients. These activities help strengthen muscle tone, prevent muscle mass loss, and improve depressive symptoms (Eller et al., 2005). Family members should encourage patients' efforts to leave the bed and be as active as possible to improve sleep and rest patterns. Although exercise and activities are important, so is sufficient sleep (6-8 hours) and frequent rest periods (30 minutes to 1 hour) throughout the day. These help to conserve energy and provide patients with opportunities to focus their energy on self-identified important tasks (Reid & Dwyer, 2005).

Outcomes assessment needs to focus on multiple issues including strengthening self-care abilities, increasing functional and emotional status, improving disease management opportunities, increasing independence, and avoiding hospital admissions. With improving health and lowering symptom burden, patients will be able to be more socially active, return to their daily tasks, and ultimately work and earn income for their families (Tsai, Holzemer, & Leu, 2005). Whereas the previous measures are more time intensive and less resource intensive, the most critical stabilizing factor for effective symptom management in HIV/AIDS is access to antiretroviral treatment (ART). Preventing opportunistic infections, preventing symptom occurrences, and stabilizing the immune system in general can reverse mor-

bidity and mortality of HIV/AIDS patients over long periods of time (Burgoyne et al., 2004). However, the political goal to give three million people in Southern Africa access to triple ART by the year 2005 has not been achieved in terms of access and distribution. It will take great effort from the local governments and health care professionals together to get a majority of the currently infected HIV patients into care (Badri et al., 2006).

These results need to be taken with a grain of salt, because they reflect a wide range of HIV disease stages similar to studies in the United States, Western Europe, and Australia prior to the availability of ART. A study conducted today with more access to ART might result in different symptom profiles similar to those of the developed world. A limiting factor in this self-report study was the inability to access patient records to confirm the HIV diagnosis or to draw blood to establish critical immunological parameter. Despite these limitations, this investigation was a valuable insight into the fatigue and symptom status of HIV/AIDS patients experiencing very different social and economic conditions than patients in the United States or Europe. More research is needed to assess fatigue and symptom prevalence in Southern African HIV/AIDS patients in all phases of their HIV illness. To improve fatigue and fatigue-related symptoms and other symptom clusters in those patients, there is a need for better documentation of living conditions, more access to biological data, more understanding of country-specific symptom management strategies, in-depth descriptions about culturally appropriate interventions for symptom management, and secured access to ART for all HIV/AIDS patients in Southern Africa.

References

Badri, M., Cleary, S., Maartens, G., Pitt, J., Bekker, L. G., Orrell, C., et al. (2006). When to initiate highly active antiretroviral therapy in sub-Saharan Africa? A South African cost-effectiveness study. *Antiviral Therapy*, *11*, 63-72.

Barroso, J., Carlson, J. R., & Meynell, J. (2003). Physiological and psychological markers associated with HIV-related fatigue. *Clinical Nursing Research*, *12*, 49-68.

Barroso, J., & Lynn, M. R. (2002). Psychometric properties of the HIV-Related Fatigue Scale. *Journal of the Association of Nurses in AIDS Care*, *13*, 66-75.

Borthwick, D., Knowles, G., McNamara, S., Dea, R. O., & Stroner, P. (2003). Assessing fatigue and self-care strategies in patients receiving radiotherapy for non-small cell lung cancer. *European Journal of Oncology Nursing*, *7*, 231-241.

Burgoyne, R. W., Rourke, S. B., Behrens, D. M., & Salit, I. E. (2004). Long-term quality-of-life outcomes among adults living with HIV in the HAART era: The interplay of changes in clinical factors and symptom profile. *AIDS Behavior*, *8*, 151-163.

Butensky, E., Kennedy, C. M., Lee, M. M., Harmatz, P., & Miaskowski, C. (2004). Potential mechanisms for altered iron metabolism in human immuno-deficiency virus disease. *Journal of the Association of Nurses in AIDS Care*, *15*, 31-45.

Cohen, F. L., Ferrans, C. E., Vizgirda, V., Kunkle, V., & Cloninger, L. (1996). Sleep in men and women infected with human immunodeficiency virus. *Holistic Nursing Practice*, *10*, 33-43.

Dodd, M., Janson, S., Facione, N., Faucett, J., Froelicher, E. S., Humphreys, J., et al. (2001). Advancing the science of symptom management. *Journal of Advanced Nursing*, *33*, 668-676.

Elenkov, I. J., Iezzoni, D. G., Daly, A., Harris, A. G., & Chrousos, G. P. (2005). Cytokine dysregulation, inflammation and well-being. *Neuroimmunomodulation*, *12*, 255-269.

Nokes Eller, L. S., Corless, I., Bunch, E. H., Kemppainen, J., Holzemer, W., , et al. (2005). Self-care strategies for depressive symptoms in people with HIV disease. *Journal of Advanced Nursing*, *51*, 119-130.

Evans, W. J. (2004). Protein nutrition, exercise and aging, *Journal of the American College of Nutrition*, *23*, 601S-609S.

Fiala, M., Murphy, T., MacDougall, J., Yang, W., Luque, A., Iruela-Arispe, L., et al. (2004). HAART drugs induce mitochondrial damage and intercellular gaps and gp120 causes apoptosis. *Cardiovascular Toxicology*, *4*, 327-337.

Grant, A. D., & De Mock, K. M. (2002). ABC of AIDS: HIV infection and AIDS in the developing world. *British Medical Journal*, *322*, 1475-1478.

Hengge, U. R. (2003). Testosterone replacement for hypogonadism: Clinical findings and best practices. *AIDS Reader*, *13*, S15-S21.

Holzemer, W. L., Hudson, A., Kirksey, K. M., Hamilton, M. J., & Bakken, S. (2001). The Revised Sign & Symptom Check-List for HIV (SSC-HIVrev). *Journal of the Association of Nurses in AIDS Care*, *12*, 60-70.

Norval, D. A. (2004). Symptoms and sites of pain experienced by AIDS patients. *South African Medical Journal*, *94*, 450-454.

Parisien, C. Gelinas, M. D., & Cossette, M. (1993). Comparison of anthropometric measures in men with HIV: Asymptomatic symptomatic, and AIDS. *American Journal of Physiology, Endocrinology and Metabolism*, *93*, 1404-1408

Perkins, D. O., Leserman, J., Stern, R. A., Baum, S. F., Liao, D., Golden, R. N., et al. (1995). Somatic symptoms and HIV infection: relationship to depressive symptoms and indicators

of HIV disease. *American Journal of Psychiatry*, *152*, 1776-1781.

Phaladze, N. A., Human, S., Dlamini, S. B., Hulela, E. B., Hadebe, I. M., Sukati, N. A., et al. (2005). Quality of life and the concept of "living well" with HIV/AIDS in sub-Saharan Africa. *Journal of Nursing Scholarship*, *37*, 120-126.

Piper, B. (1998). Fatigue. In A. B. Williams & M. E. Ropka (Eds.), *HIV nursing and symptom management* (1st ed., pp 449-470). Boston: Jones and Bartlett.

Reid, S., & Dwyer, J. (2005). Insomnia in HIV infection: A systematic review of prevalence, correlates, and management. *Psychosomatic Medicine*, *67*, 260-269.

Salomon, J., de Truchis, P., & Melchior, J. C. (2002). Body composition and nutritional parameters in HIV and AIDS patients. *Clinical Chemistry and Laboratory Medicine*, *40*, 1329-1333.

Sukati, N. A., Mndebele, S. C., Makoa, E. T., Ramukumba, T. S., Makoae, L. N., Seboni, N. M., et al. (2005). HIV/AIDS symptom management in southern Africa. *Journal of Pain and Symptom Management*, *29*, 185-192.

Tsai, Y. F., Holzemer, W. L., & Leu, H. S. (2005). An evaluation of the effects of a manual on management of HIV/AIDS symptoms. *International Journal of STD and AIDS*, *16*, 625-629.

Villamor, E., Saathoff, E., Manji, K., Msamanga, G., Hunter, D. J., & Fawzi, W. W. (2005). Vitamin supplements, socio-economic status, and morbidity events as predictors of wasting in HIV-infected women from Tanzania. *American Journal of Clinical Nutrition*, *82*, 857-865.

Voss, J. G. (2005). Predictors and correlates of fatigue in HIV/AIDS. *Journal of Pain and Symptom Management*, *29*, 173-184.

Voss, J. G., Dodd, M., Potillo, C. & Holzemer, W. L. (2006). Theories of fatigue: Application to HIV/AIDS. *Journal of the Association of Nurses in AIDS Care*, *17*, 37-50.