

An Analysis of a Self-Management Framework to Identify Factors Affecting the Need for Nutritional Supplementation among Seropositive African-American Mothers

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Abstract

Background: Self-medicating with nutritional supplements is one behavior that people living with HIV/AIDS disease engage in to help cope with their physical and mental challenges. The caregiving duties of mothers make them particularly vulnerable to these challenges.

Objective: The objective of this study was to analyze a self-management framework to identify factors affecting seropositive African-American mothers' decisions to borrow money from family members or friends to help pay for nutritional supplements.

Methods: A sample of 49 mothers enrolled in an agency providing HIV/AIDS support services in North Carolina, USA were recruited to voluntarily participate in this study by filling out a questionnaire pertaining to variables in the self-management framework and their need for nutritional supplementation. The proxy measure for this need was the question that asked mothers "During the past year, have you borrowed money from family members or friends to help pay for over-the-counter products, such as multivitamins, minerals, or nutritional drinks?" Mothers also completed the Beck Depression Inventory II and the Perceived Stress Scale.

Results: The parsimonious model derived from a stepwise logistic regression analysis identified factors within the self-management process of the self-management framework to affect mothers' need for nutritional supplementation. Both receipt of mental health care and substance-abuse treatment services ($B=2.63, p=.02$) and being cognitively-affectively depressed ($B=.18, p=.01$) were found to increase the likelihood that mothers sought financial support from family members or friends to acquire nutritional supplements.

Conclusion: It was concluded that HIV/AIDS service providers should be diligent in both the diagnosis and referral processes to ensure that clients receive the nutritional and mental health care and substance-abuse treatment services they need in order to proceed through the self-management process with a favorable prognosis.

Keywords: HIV/AIDS; Mothers; Nutritional supplements; Mental health care; Substance abuse

Introduction

The advent of highly active antiretroviral therapy (HAART) has de-elevated HIV/AIDS disease from an acute to a more manageable chronic disease [1]. In that much of the care for this disease is now managed in a home setting, people living with it are challenged to engage in disease-specific care that includes behaviors directed to symptom management and medication adherence, and generic care that involves health maintenance types of behaviors like managing psychological distress that may arise and addressing the nutritional needs that are associated with this disease [2,3]. Self-medicating with nutritional supplements is one type of behavior that people living with this disease engage in to help manage their mental challenges [4]. This psychological distress compromises the proper functioning of the body's immune system by contributing to the depletion of CD4 t-cells [5,6].

Financial stressors play an important role in the psychological distress that many people living with HIV/AIDS disease cope with [7,8]. The majority of people living with this disease have minimum financial resources at their disposable [7]. This financial situation hinders their ability to acquire nutritional supplements, and thereby, potentially elevating this mental toll on the body. Nutritional supplementation is needed to help combat both the physical and mental challenges in the

lives of people living with this disease. This dietary practice can help improve the body's biomarkers; CD4 t-cell and viral load counts [6,9,10].

The author utilizes a self-management framework to undertake an empirical analysis to identify factors affecting seropositive African-American mothers' decisions to borrow money from family members or friends to help pay for their nutritional supplements. As presented in Figure 1, this framework recognizes that in order to manage a chronic condition like HIV/AIDS, contextual risk and protective factors must be taken into account; 1) condition-specific factors-CD4 t-cell and viral load counts, 2) physical and social environment factors-physical stamina and workplace, and 3) individual and family factors-educational attainment and capacity to self-manage. Process factors must also be considered; 1) knowledge and beliefs-receipt of mental health care and substances-use treatment services and perceived stress, 2) self-regulation skills and ability-depression, and 3) social facilitation-receipt of functional social support. Both the contextual and process factors lead to proximal and distal outcomes. The proximal outcomes include self-management behaviors, such as the active involvement in symptom management activities and medication regimes, which oftentimes in HIV/AIDS clients can lead to the urgent need to use recommended pharmacological therapies like nutritional supplements. The distal outcomes entail stability or changes in health status; CD4 t-cell and viral load counts [11].

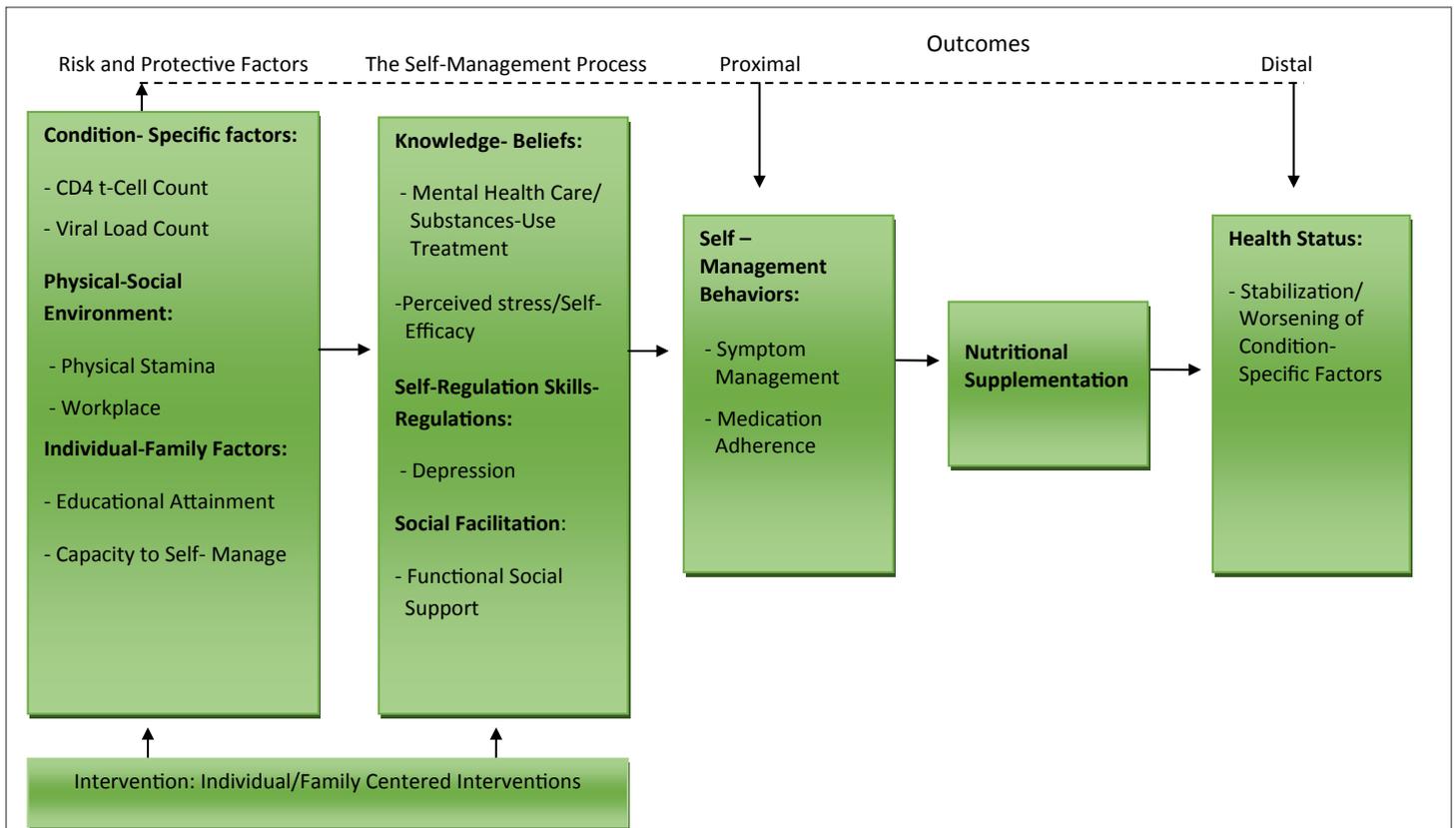


Figure 1: A Self-Management Framework to Assess the Need for Nutritional Supplementation Among People Living with HIV/AIDS Adopted with permission from Dr. Polly A. Ryan at the Self-Management Science Center at the University of Wisconsin-Milwaukee

The Self-Management Framework

Risk and protective factors

Condition-specific factors: Proper nutritional supplementation can help build both the body’s immunologic and virologic functioning as reflected in a higher CD4 t-cell count and a low to non-detectable viral load count-which means that the level of the HIV virus in the body is so low that it does not show when it is measured. HIV/AIDS clients use nutritional supplements like multivitamins and minerals in the majority of the cases [12-18]. A CD4 t-cell count above 200 helps to keep the HIV infection from progression into the full-blown AIDS disease. Such dire condition can lead to opportunistic infections like bacterial pneumonia and Kaposi’s sarcoma both of which are the main cause of morbidity in people living with HIV/AIDS [6,16,17]. A drop in CD4 t-cell count signifies that a person’s health is worsening. This can be a very stressful situation for a person living with the HIV virus. Stress contributes to the depletion of CD4 t-cells, and in the process of doing so compromises the proper functioning of the body’s immune system [5,6]. This unhealthy situation can bring about an urgent need for nutritional supplementation.

Women living with HIV/AIDS disease are an at-risk group for encountering stress in their daily lives due primarily to their care giving duties [19,20]. HIV-positive female caregivers have been found to have a higher HIV symptom distress score (measured by a lower CD4 t-cell count, higher viral load count, or an AIDS defining event) than their counterparts without these duties. Seropositive caregivers were also more likely to report lower physical quality of life scores [21]. In light of their caregiving duties, it is not surprising that mothers living with HIV/AIDS disease are more likely to be in need of nutritional supplements than fathers [12,14,18] to both help build and maintain their body’s stamina.

Physical-social environment factors: Arns, Martin, and Chernoff [21] found that very few people living with HIV infection were unemployed prior to their diagnosis. After detection of this infection, Brooks et al. [22] found that the majority of people living with HIV were without work. Both the debilitating aspects of this infection and social environment obstacles like stigma and workplace discrimination have hampered employment prospects for many of these people. Employment is a salient issue now that people living with HIV infection have longer and more productive lives [21,22]. Brooks et al. [22] found that the majority of unemployed people living with this infection plan to work either now or in the near future.

Individual-family factors: A balanced diet is important for HIV/AIDS clients because low energy intake combined with increased energy demands that are attributed to this disease and its related infections are the major driving forces behind HIV-related weight loss and wasting [23]. Educational attainment plays a key role in the diets of people living with HIV/AIDS disease. Kim et al. [24] found that people living with this disease were likely to have an inadequate nutritional intake as well as consume less than the recommended daily allowance of vitamin A. Both females and people with lower educational attainment were likely to have an inadequate nutritional intake. To prevent problems, such as weight loss and wasting, lower educated and resource-constrained women may depend on their social support systems to help them financially with their nutritional needs.

The Self-Management Process

Knowledge-beliefs

The shift from an acute type of care to chronic care brings about an emphasis to self-management of the disease where HIV/AIDS clients are required to assume an active and informed role in managing the physical,

psychological, and social aspects of their health [25]. In many mental health care and substance-abuse treatment programs information on healthy living is provided to clients in these programs. Depending on the clients' needs and goals, they are afforded an opportunity to gain much needed knowledge about the nutritional aspects of their mental illness and addiction. Grant et al. [26] found a positive relationship between receipt of nutrition education and substance-abuse treatment outcomes. This combination of services helps to improve the clients' overall quality of life. Achieving goal congruency is integral to the treatment process. Barroso and Sandelowski [27] found that for mothers living with HIV/AIDS disease, children were the driving catalyst for their desire to enter mental health and substance-abuse treatment so that they could free themselves of drugs and alcohol and to become better mothers for their children.

The achievement of goal congruency, in part, is depended on an individual's belief about his/her ability to complete tasks and reach goals. Self-efficacy plays an important role in how individuals perceive situations and behave and respond to different life situations, which could be stressful for mothers living with HIV/AIDS disease attempting to set goals that are not only in their own best interests but their children's as well. Both the physiological and immunological responses to potentially stressful life situations are due primarily to an individual's assessment of the event, the perceived stress, rather than the actual event itself [28]. Mothers living with this disease may perceive the stress associated with their desire to overcome their adverse life situations as overwhelming and beyond their ability to manage it [29]. Ellis [5] found a positive relationship between perceived stress levels in mothers living with HIV/AIDS disease and the need to borrow money from family members or friends to help pay for nutritional supplements. It is plausible that due to the toll of stressors in those mothers' lives, they embarked upon this self-management strategy to help replenish their lost CD4 t-cells and build their body's immune system.

Self-regulation skills-abilities

Depression has an adverse impact on proper food intake resulting in serious nutritional problems for many people living with HIV/AIDS disease. Both poor appetite and weight loss are major issues [30]. In the United States, approximately 5% of the population is either malnourished or has low body weight [31]. Depressed adults living with HIV/AIDS disease have been found to have lower total energy intake, and more decreases in their overall dietary components than their non-depressed counterparts [30].

Both multivitamin supplements and prescribed drugs have been found to be beneficial in treating depression [32]. However, many of the latter drugs have unwanted side effects [33]. When taken as recommended, multivitamin supplements have an advantage over prescribed drugs in that they are absorbed more easily in the body and they come with fewer side effects making them a flexible addition to the treatment regimen [32].

Social facilitation

Social support affects both the physical and mental aspects of the lives of people living with HIV/AIDS disease. An inverse relationship has been found between HIV/AIDS-infected peoples' levels of satisfaction with social support received and number of HIV/AIDS-related physical symptoms [34]. The lack of social support has been found to elevate depressive symptoms in seropositive people [36]. Social support needs to be functional in that it entails building social relationships [35,36,37] and providing tangible resources [38]. Talking with family and friends has been found to be a commonly used strategy to manage HIV-related anxiety [39].

Proximal Outcomes

Self-management behaviors

People living with HIV/AIDS disease partake in symptom management strategies to decrease the frequency, intensity, and distress of their disease-related symptoms with the optimal goal of improving their quality of life [40]. This disease requires daily involvement in self-management strategies to help cope with its symptoms [41]. Some of these symptoms include anxiety, depression, diarrhea, fatigue, nausea, vomiting, and neuropathy [40,42]. Substances use is a common strategy that many people living with this disease employ to help ease their disease-related symptoms [40-47]. The outcomes of this self-management strategy are rather perplexing. Some scholars have labeled substances-use behaviors as an ineffective coping strategy [4,48] while others found those behaviors to be beneficial in helping people living with HIV/AIDS disease deal with their disease-related symptoms [41,42].

However beneficial the use of substances could be in helping seropositive people to cope with their psychological distress, nutrition as a risk factor during substance abuse is known for the role it plays in provoking health problems. This self-management strategy affects eating patterns and a distorted eating behavior can bring about the onset of eating disorders like anorexia, bulimia, and habitual eating [49]. Virmani et al. [49] noted that many alcoholics are malnourished which is attributed, in part, to the fact that alcohol and its metabolism prevent the body from properly absorbing, digesting, and using nutrients the body needs in order to function as it should. This unhealthy situation decreases energy intake during the time when people living with HIV/AIDS disease need all the strength that they can muster.

Medication adherence

The four primary goals of HAART are to improve or preserve immune functioning, alleviate any HIV-related symptoms, prevent opportunistic infections, and improve the overall quality of life of people living with HIV/AIDS disease [50]. For such goals to be realized, high adherence levels are required. In fact, rates greater than 95% are required for adequate adherence [50,51]. Receipt of HAART is around the 85% mark [52,53]. However, non-adherence of this medicine is a concern [52].

Distal outcomes

Health status: An adequate diet is critical for HAART adherence. Inadequate nutrition circumvents the ability of HIV/AIDS clients to achieve their HAART goals by contributing to the problems of both wasting and the onset of opportunistic infections due to a decline in CD4 t-cell count [54]. Evans et al. [55] found HIV-infected adults with low weight receiving HAART plus a nutritional supplement to demonstrate a greater increase in weight, CD4 t-cell count, and red and white blood cells between baseline and a 6-month follow-up than their counterparts who were taking only HAART.

Methods

Data collection

Data were obtained from women enrolled in a social service agency that provides HIV/AIDS support services to both single women and women with children in North Carolina, USA. To obtain clearance for these women to participate, a proposal detailing the study and the questionnaire used in it were presented to and approved by the board of directors of this agency. The Board granted the service provider permission to distribute the questionnaire to women who were receiving these services. This questionnaire was distributed only to women with children. These women were recruited primarily because of the high likelihood that they would endure stress in their daily lives due to the burden of their caregiving

duties which could obliterate their energy, and by doing so heighten the need for nutritional supplementation.

The questionnaire gauged information about the seropositive mothers' 1) employment status, 2) educational attainment, 3) mental health care and substance-abuse treatment history (whether or not diagnosed and enrollment in a treatment facility), 4) social support (advice received from family members, friends, spouse, or church pastor, and 5) medication adherence (whether or not a dose of medicine was missed in the past month, number of doses missed, and medication was stopped and by whom). Social support also included a tangible financial measure whereby mothers were asked "During the past year, have you borrowed money from family members or friends to help pay for over-the-counter products, such as multivitamins, minerals, or nutritional drinks?" This question was a proxy measure for mothers' need for nutritional supplementation. The Board allowed the service provider to include information-CD4 t-cell and viral load counts-on the questionnaire that was taken from the mothers' case records with their permission. The mothers also completed the Beck's Depression Inventory II (BDI II) [56] and the Perceived Stress Scale (PSS) [57].

On distribution of this questionnaire during scheduled home visits, the service provider explained to seropositive mothers the purpose of the study and thoroughly read instructions for completing the questionnaire. After which, the questionnaire was left with mothers to be self-administered; however, during subsequent home visits there was a need for the service provider to provide additional explanations for some questionnaire items to many mothers.

Participation in this study was strictly voluntary, and refusal to participate had no effect on seropositive mothers' enrollment in this agency. To encourage participation in the study, mothers were provided a donation of non-perishable food items and given a \$10 gift card.

Sample

Of the 80 HIV/AIDS-infected women who were enrolled in this agency during 2007 and 2008, 50 (63%) were mothers. Forty-nine mothers fully completed the questionnaire. The final sample included 49 mothers. The statistical power of the study was computed using the DSS Power Calculator [58]. The computed statistical power was 98 for a two-tailed test with test value=25, sample average=27, n=49, and sample standard deviation=3.48. It should be noted that this statistical power is higher than the recommended power score of 80 that is typically used in research studies [59].

Measurement of scales

Cognitive-affective depression: Items 1-13 of the BDI II reflected seropositive mothers' feelings about themselves during the past month. These items were used to create a cognitive-affective depression subscale [56]. Seropositive mothers scored on a scale ranging from 0-3 items that included sadness, pessimism, failure, satisfaction with self, guilt, punishment, self-dislike, self-accusations, suicidal thoughts, crying, irritability, social withdrawn, and inability to make decisions. The items were summed to arrive at a total score. There was strong internal consistency among the items; the Cronbach's Alpha exceeded .90.

Somatic depression: Items 14-19 of the BDI II were used to create a somatic depression subscale [56]. Seropositive mothers scored on a scale ranging from 0-3 items that included physical appearance, workplace fitness, tiredness, sleep patterns, appetite, and weight loss. The somatic depression subscale was used as a proxy measure of the mothers' physical stamina. The items were summed to arrive at a total score. Items 20 and 21 on the BDI II were omitted because of their high likelihood of endorsement by people living with HIV/AIDS disease without being necessarily indicative of depression [60]. The Cronbach's Alpha for this subscale was .82, which indicates that the somatic depression subscale is

reliable with good internal consistency among the items.

Perceived stress scale: The PSS consisted of 10 items, and was used to measure the seropositive mothers' perceived stress levels during the past month [57]. The items included being upset over an unexpected event, unable to control important things in life, feeling nervous, feeling confident about their ability to handle problems, feeling that things were going their way, unable to cope with the things they had to do, able to control irritations in life, feeling on top of things, being angered, and feeling that difficulties were piling up so high that they could not overcome them. A 5-point Likert-type scale (0=Never to 4=Very often) was used to assess these items. The score on 4 of the items that was in the opposite direction was reversed coded. For example "In the last month, how often have you felt things were going your way?" There was strong internal consistency among the items; the Cronbach's Alpha exceeded .90.

Data analysis

This study used descriptive statistics, t-tests, and a stepwise logistic regression analysis. This analysis is most appropriate for a binary or categorical dependent variable-whether or not seropositive mothers borrowed money from their family members or friends to help pay for nutritional supplements. A logistic regression analysis is well suited for describing relationships between a binary or categorical dependent variable and a set of independent variables [61]. The stepwise logistic regression is designed to find the most parsimonious set of independent variables that are most effective in predicting differences in the dependent variable [62].

The forward stepwise variable selection was used to add independent variables to the model one at a time using the statistical criterion of reducing the -2 Log Likelihood errors for the included variables. This criterion was set at .05 or higher. The Likelihood-Ratio criterion is the recommended method for removing variables from the model based on the change in -2 Log Likelihood when each variable in the model was deleted. If the observed significance level was greater than the .05 cutoff values for remaining in the model, the variable was removed from the model and the model was recalculated to determine if other variables were eligible for removal. The process of adding more variables into the model stopped when all of the available variables had been included in the model or when it was not possible to make a significant reduction in -2 Log Likelihood using any of the variables that had not been included in the model. The goal of the stepwise logistic regression analysis was to produce a predictive model that was parsimonious and accurate because it excluded independent variables that did not contribute to explaining any differences in the dependent variable [60]. SPSS (version 13) was used to analyze the data. All missing data were excluded from the statistical analyses.

Results

Descriptive statistics

Nearly two-thirds (65%) of the seropositive mothers were living with HIV infection. This infection had progressed to AIDS disease in 35% of these mothers. The mean CD4 t-cell count was 470.65 (cells/mm³). The mean viral load count was 144999.18 (copies/ml).

Sixty-one percent of the mothers had missed at least one dose of medication during the past month. A third of the mothers were employed. The mothers were split between having a grade school education (50%) and a high school diploma to a college degree (50%). The mean score on the somatic depression subscale was 10.67; the scores ranged from 1 to 24. The mothers' mean perceived stress score was 19.96, with a low score of 3 and high score of 40. The mean cognitive-affective depression score was 7.61, these scores ranged from 0 to 25. Nearly a third (31%)

of the mothers was enrolled in a mental health care and substance-abuse treatment facility. The majority of mothers received social support from family members (92%), friends (61%), and church pastor (53%). A third of the mothers received this support from their spouses (Table 1).

Stepwise logistic regression analysis

A stepwise logistic analysis, using the forward variable selection method, was used to arrive at a parsimonious model identifying factors affecting seropositive mothers' decisions to borrow money from family members or friends to help pay for nutritional supplements, such as multivitamins, minerals, and nutritional drinks. Both enrollment in a mental health care and substance-abuse treatment facility ($B=2.63, p=.02$) and higher scores on the cognitive-affective depression subscale ($B=.18, p=.01$) were found to increase the likelihood that these mothers sought financial support from family members or friends to acquire nutritional supplements. The model was statistically significant (Model $X^2=14.79, p=.001$). Over three-fourths (76%) of the cases were classified correctly in the analysis (Table 2).

Discussion

A self-management framework was used to build a stepwise logistic regression model to identify factors affecting seropositive mothers' decisions to borrow money from their family members or friends to

Variable	Frequency	Percentage	Mean
CD4 t-cell Count			470.65 (cells/mm ³)
Viral Load Count			144999.18 (copies/ml)
Somatic Depression			10.67
Cognitive-Affective Depression			7.61
Perceived Stress			19.96
Employed			
No	29	67	
Yes	14	33	
Mental Health Care/ Substance-Abuse Treatment			
No	34	69	
Yes	15	31	
Education			
College Degree	1	2	
Some College	9	19	
High School Diploma	14	29	
Grade School	24	50	
Social Support			
Family			
No	4	8	
Yes	45	92	
Friends			
No	19	39	
Yes	30	61	
Spouse			
No	33	67	
Yes	16	33	
Church Pastor			
No	23	47	
Yes	26	53	
Miss Dose			
No	19	39	
Yes	30	61	

Table 1: Bio-Markers and Socio-Economic Characteristics of Seropositive African-American Mothers

The Self-Management Framework	B	S.E	Wald	df	Exp (B)	p-Value
Risk and Protective Factors						
CD4 t-Cell						
Viral Load						
Somatic Depression						
Employment						
Education						
The Self-Management Process						
Mental Health Care/ Substance- Abuse Treatment	2.63	1.18	4.89	1	13.88	.02
Perceived Stress						
Cognitive-Affective Depression	.18	.07	6.15	1	1.20	.01
Social Support						
Family						
Friends						
Spouse						
Church pastor						
Proximal Outcomes						
Miss Dose						

Table 2: Stepwise Logistic Regression of Factors Affecting Seropositive African-American Mothers' Need for Nutritional Supplementation ($n=42$), Model $X^2=14.79, p=.001$, Percentage of Cases Classified Correctly=76%

help pay for nutritional supplements. The parsimonious model derived from this analysis yielded only those factors that were within the self-management process of this framework to affect mothers' decision-making in this regard; knowledge and self-regulation skills. Mental health care and substance-abuse treatment facilities afford the opportunity for mothers to gain invaluable knowledge about the nutritional aspect of their HIV/AIDS disease and mental health and substance-abuse problems [26]. It is very plausible that these resource-constrained mothers reached out to family members or friends to ensure they were financially able to acquire nutritional supplements that their bodies needed to properly function.

It is worth noting that nearly two thirds (62%, $n=8/13$) of the seropositive mothers who borrowed money from family members or friends to help pay for nutritional supplements were enrolled in a mental health care and substance-abuse treatment facility to receive services for both their drug and alcohol addictions. The health of 6 (75%) of these 8 mothers was dire; they were living with AIDS disease. These mothers were most in need of nutritional supplementation to help cope with a dual diagnosis of substance abuse and AIDS.

Nutritional supplements, such as multivitamins, minerals, or nutritional drinks, can be purchased over-the-counter; a doctor's written prescription is not required to buy them. The resource-constrained seropositive mothers were not receiving any help from the government to assist them in acquiring these much needed products. These over-the-counter products are an out-of-pocket expense. They are not covered by Medicaid; a government health insurance program for low-income people [5,11]. Therefore, seeking out financial support from family members or friends should be viewed as a last resort for these mothers and, in all likelihood, a life saver for them.

Policymakers at the state level in North Carolina can play a pivotal role in alleviating this financial stress for both seropositive mothers and their family members or friends by simply adding nutritional supplements to Medicaid's list of over-the-counter product offerings [63]. In fact, Schwalberg, Bellamy, Griffin, Miller, Williams, and Health Systems Research found that in 21 states Medicaid did not provide coverage for

these products [64]. There are pharmaceutical assistance programs that help resource-constrained people with their nutritional needs. The problem is that many of the manufacturers that offer those programs are faced with budgetary challenges which have forced them to curtail enrollment [11].

The seropositive mothers' ability to self-regulate or cognitive-affective depression was positively associated with borrowing money from family members or friends to help acquire nutritional supplements. The recommended cut-off score for the cognitive-affective depression subscale of the BDI II is 10 [56,60]. Using this threshold, a third of all mothers were depressed. This finding is in range with Kalichman et al. [60] who found 34% of their HIV-positive sample to be cognitively-affectively depressed.

In this study, 48% (n=13/27) of the seropositive mothers who borrowed money from family members or friends to help pay for nutritional supplements were cognitively-affectively depressed. The mean cognitive-affective depression score for these mothers was doubled that for their counterparts who had not received this type of financial support from their social support systems (10.41 and 4.18, respectively, $t=-3.49$, $p=.001$). Of the 13 mothers who sought financial help from family members or friends to acquire multivitamins, minerals, or nutritional drinks, close to two-thirds (62%, n=8) of them were living with AIDS disease. These mothers were in need of nutritional supplementation to help cope with their dual diagnosis of mental distress and AIDS.

Implications

The parsimonious stepwise logistic regression model derived from the self-management framework identified seropositive mothers who were dually diagnosed with a substance-abuse problem and AIDS disease as well as being cognitively-affectively depressed to be the most in need of nutritional supplementation. This framework suggests that these mothers were inept to adequately handle the self-management process due to their addictions and depressed state of being. Many HIV/AIDS service providers are not trained as nutritionists. The problem is that while 47% of the mothers were diagnosed with a substance-abuse problem, 48% (n=11) of the 23 mothers with this problem were not enrolled in a mental health care and substance-abuse treatment facility to receive services for their drug and alcohol addictions nor learn about the nutritional aspects of their HIV/AIDS disease [26]. Clearly, there is a need for HIV/AIDS service providers to not only refer their clients with a substance-abuse problem to a mental health care and substance-abuse treatment facility but also follow-up with them to ensure that they are enrolled in a facility and receiving services they need to help them manage this disease.

Of the 16 seropositive mothers who were cognitively-affectively depressed, 12 (75%) of them were diagnosed with a substance-abuse problem. Rand Health [65] found many clients living with HIV infection to have psychiatric problems and to be either drug-dependent, heavy drinkers, or both. In this study, the problem is that while over two-thirds (67%, n=8) of these mothers were enrolled in a mental health care and substance-abuse treatment facility, only 2 (25%) of the 8 mothers were in treatment for their depression.

With so few of the depressed mothers receiving treatment only highlights the fact that this mental health condition oftentimes goes unrecognized, and therefore, is likely not treated due to the similarity of its symptoms with those of HIV [66]. Vyavaharkar et al. [35] found the majority of depressed African-American women living with HIV had not received any treatment for this mental health condition. It is critical that mental health care services include both the diagnosis and rigorous management of depression to help enhance the quality of life for seropositive women in general, and mothers in particular as they assume

the dual burden of providing care and nurturance to both themselves and their families [19,20].

Conclusion

The seropositive mothers who were dually diagnosed with AIDS disease and substance abuse as well as coping with cognitive-affective depression were most in need of nutritional supplementation. These vulnerable resource-constrained mothers were left to depend on their family members or friends to help them acquire the nutritional supplements that their bodies needed in order to properly function. Unfortunately, many of these mothers were not enrolled in a mental health care and substance-abuse treatment facility to learn about; 1) the nutritional aspect of their AIDS disease, 2) an addiction-free life, and 3) their depression. Therefore, it is concluded that HIV/AIDS service providers should be diligent in both the diagnosis and referral processes to ensure that clients receive the mental health care and substance-abuse treatment services they need in order to proceed through the self-management process with a favorable prognosis.

Limitations

While the sample of 49 mothers used in this study represented nearly all of the 50 mothers receiving HIV/AIDS support services in one social service agency, this relatively small number of mothers limits the generalizability of the findings to the population of mothers living with the HIV/AIDS disease. It is important to note that the power score of 98 of this study was strong. Secondly, the intent of the research methodology was to have mothers self-administer the questionnaire they were requested to complete. The fact that the service provider in this agency had to explain items on this instrument to many mothers suggests that readability was an issue. The strength of this methodology was that the service provider was allowed by the Board of the agency to provide information from case records with permission of the mothers.

References

- Gifford A, Groessl E (2002) Chronic disease self-management and adherence to HIV medications. *J Acquir Immune Defic Syndr* 31: S163-S166.
- Barlow J, Wright C, Sheasby J, Turner A, Hainsworth J (2002) Self-management approaches for people with chronic conditions: a review. *Patient Educ Couns* 48: 177-187.
- Chou FY, Holzemer WL (2004) Linking HIV/AIDS clients' self-care with outcomes. *J Assoc Nurses AIDS Care* 15: 58-67.
- Kemppainen JK, Holzemer WL, Nokes K, Eller LS, Corless IB, et al. (2003) If-care management of anxiety and fear in HIV disease. *J Assoc Nurses AIDS Care* 14: 21-29.
- Ellis WL (2012) Perceived stress levels among HIV/AIDS-infected mothers: the role of over-the-counter products. *Soc Work Health Care* 51: 850-867.
- Remor E, Penedo F, Shen BJ, Schneiderman N (2007) Perceived stress is associated with CD4 t-cell decline in men and women living with HIV/AIDS in Spain. *AIDS Care* 19: 215-219.
- Musgavero M, Raper J, Reif S, Whetten K, Lesserman J, et al. (2009) Overload: impact of incident stressful events on antiretroviral medication adherence and virologic failure in a longitudinal multisite human immunodeficiency virus cohort study. *Psychosom Med* 71: 920-926.
- Koopman C, Gore-Felton C, Marouf F, Butler LD, Field N, et al. (2000) Relationships of perceived stress to coping attachment and social support among HIV-positive persons. *AIDS Care* 12: 663-672.
- Hasan S, See C, Choong C, Ahmed S, Ahmadi K, et al. (2010) Reasons,

- perceived efficacy, and factors associated with complementary and alternative medicine use among Malaysian patients with HIV/AIDS. *The J Altern Complement Med* 16: 1171-1176.
10. Kalichman S, Cherry C, White D, Jones M, Kalichman M, et al. (2012) Use of dietary supplements among people living with HIV/AIDS is associated with vulnerability to medical misinformation on the internet. *AIDS Res Ther* 9: 1-8.
 11. Ellis WL (2015) A self-management framework to assess the need for nutritional supplementation in people living with HIV/AIDS. In Watson R (ed) *Health of HIV infected people: Food, Nutrition and Lifestyle with antiretroviral drugs*. Philadelphia, PA: Elsevier Inc., 99-115.
 12. Agnoletto V, Chiaffarino F, Nasta P, Rossi R, Parazzini F (2006) Use of complementary and alternative medicine in HIV-infected subjects. *Complement Ther Med* 14: 193-199.
 13. Bormann J, Uphold C, Maynard C (2009) Predictors of complementary/alternative medicine use and intensity of use among men with HIV infection from two geographical areas in the United States. *J Assoc Nurses AIDS Care* 20: 468-480.
 14. Gore-Felton C, Vosvick M, Power R, Koopman C, Ashton E, et al. (2003) Alternative therapies: a common practice among men and women living with HIV. *J Assoc Nurses AIDS Care* 14: 17-27.
 15. Aghdassi E, Bondar H, Salit IE, Tinmouth J, Allard JP (2009) A survey on the usage of supplements in Canadian patients living with HIV. *Curr HIV Res* 7: 555-561.
 16. Evans D, Have T, Douglas S, Gettes D, Morrison M, et al. (2002) Association of depression with viral load, CD8 t lymphocytes, and natural killer cells in women with HIV infection. *Am J Psychiatry* 159: 1752-1759.
 17. Ickovics J, Hamburger M, Vlahov D, Schoenbaum E, Schuman P, et al. (2008) Mortality, CD4 cell count decline, and depressive symptoms among HIV-seropositive women. *JAMA* 285: 1466-1474.
 18. Milan F, Arnsten J, Klein R, Schoenbaum E, Moskaleva G, et al. (2008) Use of complementary and alternative medicine in inner-city persons with or at risk for HIV infection. *AIDS Patient Care STDs* 22: 811-816.
 19. Hackl K, Somlai A, Kelly J, Kalichman S (1997) Women living with HIV/AIDS: the dual challenge of being a patient and caregiver. *Health Soc Work* 22: 53-62.
 20. Marc L, Zerden M, Ferrando S, Testa M (2011) HIV+ care givers and HIV+ non-caregivers: differences in sociodemographics, immune functioning, and quality-of-life. *AIDS Care* 23: 880-891.
 21. Arns PG, Martin DJ, Chernoff RA (2004) Psychosocial needs of HIV-positive individuals seeking work force re-entry. *AIDS Care* 16: 377-386.
 22. Brooks RA, Martin DJ, Ortiz DJ, Veniegas RC (2004) Perceived barriers to employment among persons living with HIV/AIDS. *AIDS Care* 16: 756-766.
 23. WHO (2003) *Nutrient requirements for people living with HIV/AIDS: report of a technical consultation*. Geneva, Switzerland: World Health Organization.
 24. Kim J, Spiegelman D, Rimm E, Gorback SL (2001) The correlates of dietary intake among HIV-positive adults. *Am J Clin Nutr* 74: 852-861.
 25. Swendeman D, Ingram B, Botheram-Borus M (2009) Common elements in self-management of HIV and other chronic illnesses. *AIDS Care* 21: 1321-1334.
 26. Grant LP, Haughton B, Sachan DS (2004) Nutrition education is positively associated with substance abuse treatment program outcomes. *J Am Diet Assoc* 104: 604-610.
 27. Barroso J, Sandelowski M (2004) Substance abuse in HIV-positive women. *J Assoc Nurses AIDS Care* 15: 48-59.
 28. Hand GA, Phillips KD, Dudgeon WD (2006) Perceived stress in HIV-infected individuals: Psychological correlates. *AIDS Care* 18: 1011-1017.
 29. Darling C, Olmstead S, Tiggelman C (2009) Persons with AIDS and their support persons: stress and life satisfaction. *Stress Health* 26: 33-44.
 30. Isaac R, Jacobson D, Wanke C, Hendricks K, Knox T, et al. (2007) Decline in dietary macronutrient intake in persons with HIV infection who develop depression. *Public Health Nutrition* 11: 124-131.
 31. Cheskin L, Margolick J, Kahan S, Mitola A, Poddar K, et al. (2010) Effect of nutritional supplements on immune function and body weight in malnourished adults. *Nutr Metab Insights* 3: 25-35.
 32. Quinn C (2009) Supplements for mental health. *Mental Health Practice* 12: 26-27.
 33. Lakhan S, Vieira K (2008) Nutritional therapies for mental disorders. *Nutr J* 7: 1-8.
 34. Aston E, Vosvick M, Chesney M, Gore-Felton C, Koopman C, et al. (2005) Social support and maladaptive coping as predictors of the change in physical health symptoms among persons living with HIV/AIDS. *AIDS Patient Care STDs* 19: 587-598.
 35. Vyavharkar M, Moneyham, L, Corwin S, Saunders R, Annang L, et al. (2010) Relationships between stigma, social support, and depression in HIV-infected African American women living in the rural southeastern United States. *J Assoc Nurses AIDS Care* 21: 144-152.
 36. Prachakul W, Grant J, Keltner N (2007) Relationships among functional social support, HIV-related stigma, social problem solving and depressive symptoms in people living with HIV: a pilot study. *J Assoc Nurses AIDS Care* 18: 67-76.
 37. Hurdle DE (2001) Social support: a critical factor in women's health and health promotion. *Health Soc Work* 26: 72-79.
 38. Kimberly J, Serovich J (1996) Perceived social support among people living with HIV/AIDS. *Am J Fam Ther* 24: 41-53.
 39. Kempainen J, Wantland D, Voss J, Nicholas P, Kirksey K, et al. (2012) Self-care behaviors and activities for managing HIV-related anxiety. *J Assoc Nurses AIDS Care* 23: 111-123.
 40. Hughes A (2004) Symptom management in HIV-infected patients. *J Assoc Nurses AIDS Care* 15: S7-S13.
 41. Robinson L, Rempel H (2006) Methamphetamine use and HIV symptom self-management. *J Assoc Nurses AIDS Care* 17: 7-14.
 42. Corless I, Lindgren T, Holzemer W, Robinson L, Moezzi S, et al. (2009) Marijuana effectiveness as an HIV self-care strategy. *Clin Nurs Res* 18: 172-193.
 43. Pence B, Thielman N, Whetten K, Ostermann J, Kumar V, et al. (2008) Coping strategies and patterns of alcohol and drug use among HIV-infected patients in the United States southeast. *AIDS Patient Care STDs* 22: 869-877.
 44. Cavaleri M, Elwyn L, Pilgrim A, London K, Indyk D, et al. (2011) Patterns of treatment use and barriers to care among hospitalized adults with HIV. *J HIV AIDS Soc Serv* 10: 414-427.
 45. Palepu A, Horton N, Tibbetts N, Meli S, Samet J (2004) Uptake and adherence to highly active antiretroviral therapy among HIV-infected people with alcohol and other substance use problems: the impact of substance abuse treatment. *Addiction* 99: 361-368.
 46. Galvin F, Bing E, Flesihman J, London A, Caetano R, et al. (2002) The prevalence of alcohol consumption and heavy drinking among people with HIV in the United States: results from the HIV cost and services utilization study. *J Stud Alcohol* 63: 179-186.
 47. Cohn S, Jiang H, McCutchan A, Koletar S, Murphy R, et al. (2011) Association of ongoing drug and alcohol use with non-adherence to antiretroviral therapy and higher risk of AIDS and death: results from ACTG 362. *AIDS Care* 23: 775-785.
 48. Nicholas P (2011) Unhealthy substance-use behaviors as symptom-

- related self-care in persons with HIV/AIDS. *Nurs Health Sci* 13: 16-26.
49. Virmani A, Binienda Z, Ali S, Gaetani F (2006) Links between nutrition, drug abuse, and the metabolic syndrome. *Ann N Y Acad Sci* 1074: 303-314.
 50. Kurtyka D (2013) HIV/AIDS in 2012. Advance Healthcare Network.
 51. Osterberg L, Blaschke T (2005) Adherence to medication. *N Engl J Med* 353:487-497.
 52. Beer L, Heffelfinger J, Frazier E, Mattson C, Roter B, et al. (2012) Use of and adherence to antiretroviral therapy in a large U.S. sample HIV-infected adults in care, 2007-2008. *Open AIDS J* 6: 213-223.
 53. Stevens P, Hildebrandt E (2009) Pill taking from the perspective of HIV-infected women who are vulnerable to antiretroviral treatment failure. *Qual Health Res* 19: 593-604.
 54. Chou FY, Holzemer W, Portillo C, Slaughter R (2004) Self-care strategies and sources of information for HIV/AIDS symptom management. *Nurs Res* 53: 332-339.
 55. Evans D, McNamara L, Maskew M, Selibas K, Amsterdam D, et al. (2013) Impact of nutritional supplementation on immune response, body mass index and bioelectrical impedance in HIV-positive patients starting antiretroviral therapy. *Nutr J* 12: 1-14.
 56. Beck T, Steer A (1983) BDI: Beck depression inventory manual. New York, NY: Psychological Corporation 1993.
 57. Cohen S, Kamarch T, Mermelstein R (1983) A global measure of perceived stress. *J Health Soc Behav* 24: 385-396.
 58. DSS Research (2015) Statistical power calculator.
 59. Hunt AA (2015) Researcher's guide to power analysis.
 60. Kalichman S, Sikkema K, Somlai A (1995) Assessing people with human immunodeficiency virus (HIV) infection using the beck depression inventory: Disease processes and other potential confounds. *J Pers Assess* 64: 86-100.
 61. Peng CJ, Ingersoll GM (2002) An introduction to logistic regression analysis and reporting. *J Educ Res* 96: 3-14.
 62. Norusis M (1999) SPSS: Regression models 10.0. Chicago, Ill: SPSS Inc.
 63. North Carolina Division of Medical Assistance (2010) Attachment A: Over-the counter products. Department of Health and Human Services, Raleigh, NC.
 64. Schwalberg R, Bellamy H, Giffin M, Miller C, Williams S (2001) Medicaid outpatient prescription drug benefits: findings from a national survey and selected case highlights. The Casey Family Foundation, Washington, DC.
 65. Rand Health (2007) Mental health and substance abuse issues among people with HIV. Santa Monica, CA.
 66. Valente SM (2003) Depression and HIV disease. *J Assoc Nurses AIDS Care* 14:41-5.