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Beck Depression Inventory-II: Factor Analyses with Three Groups of Midlife Women of African Descent in the Midwest, the South, and the U.S. Virgin Islands

Faye Gary, EdD, MS, RN, FAAN [Professor],

Case Western Reserve University, Cleveland, Ohio

Hosseini Yarandi, PhD [Professor],

Wayne State University, Detroit, Michigan

Edris Evans, BS, RN [Instructor],

University of the Virgin Islands, St. Thomas, U Virgin Islands

Carolyn Still, PhD, RN [Assistant Professor],

Case Western Reserve University, Cleveland, Ohio

Princie Michels [Nurse Practitioner, Retired],

University Health, University of Florida, Gainesville, FL

Mona Hassan, PhD, RN [Assistant Professor],

Prairie A. & M. University, Houston, Texas

Doris W. Campbell, PhD, RN, FAAN [Professor Emerita], and

University of South Florida, Tampa, Florida

Ruzica Conic, MD [Post-Doctoral Fellow]

Case Western Reserve University, Cleveland, OH

Abstract

This research encompasses a factor analysis of the Beck Depression Inventory-II (BDI-II), which involves three groups of midlife women of African descent who reside in the Midwest, the South, and the U.S. Virgin Islands. The purpose of the study was to determine the factor structure of the BDI-II when administered to a sample of women aged 40–65 of African descent who reside in the three distinct geographical regions of the United States. A correlational, descriptive design was used, and 536 women of African descent were invited to participate in face-to-face interviews that transpired in community settings. Results of the factor analysis revealed a two-factor explanation. Factor one included symptoms such as punishment feelings and pessimism (cognitive), and the second factor included symptoms such as tiredness and loss of energy (somatic-affective). The application of the Beck Depression Inventory-II among the three groups of women generated specific information about each group and common findings across the groups. Knowledge gained from the research could help to guide specific intervention programs for the three groups of women, and explicate the common approaches that could be used for the three groups.

Keywords

Beck Depression Inventory-II; depressive symptoms; Black women; stress; access to care; chronic health problems; mid-life

Introduction

Depression is the most pervasive psychiatric problem in the world, with more than 300 million people suffering from this disorder (World Health Organization, 2017a, 2017b), and it can impact functions at work, school, community, and family. Fewer than half of all individuals in the world receive treatment for depression, even though effective treatment is available. In the United States, depression is associated with higher rates of chronic illnesses, and impaired functioning but rates of detection and treatment are low and frequently inadequate (Pratt & Brody, 2014). Among adults between the ages of 40-59, the rate of depression is about 10% of the population, with older adults having lower rates than those individuals in younger groups (Pratt & Brody, 2014). Blacks were reported to have higher rates of mild to moderate depression than their White counterparts (Bryant, Haynes, Greer-Williams, & Hartwig, 2014). Also, individuals living below the poverty level were more likely to have depression when compared to those persons with higher incomes (Pratt & Brody, 2014). The economic burden of depression is about \$210 billion per year (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015). Given the magnitude of this malady, researchers have indicated that interventions for prevention and early detection of depressive symptoms should begin during the formative years (Rice et al., 2014).

Mood symptoms often associated with depression include sadness, sleep and appetite disturbances, despair, and suicidal ideation (American Psychiatric Association, 2013; Auxemery, 2014). A diagnosis of depression requires a formal history and psychiatric interview, and assessment based on criteria as defined in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013; Kalibatseva, Leong, & Ham, 2014; Pjesic et al., 2014; van Rijsbergen et al., 2014). Unraveling the manifestations of depressive symptoms, the first step toward prevention and treatment among midlife African American women is essential. Both depression and depressive symptoms are associated with a poor quality of life, lost days of employment, and higher morbidity and mortality rates (Draper et al., 2014; Joshi, Khanna, & Shah, 2015; Velazquez Rivera et al., 2014). Women of African descent in the United States and the U.S. Virgin Islands might experience more depressive symptoms than their White counterparts. Perhaps because of their socioeconomic status and the related stress experienced with being poor and minority are associated with the potential for depressive symptoms (Beck, Steer, & Brown, 1996). However, more research is needed to help unravel the social determinants of health. Many of these determinants are related to reported lower rates of depression and depressive symptoms among Blacks when considering the multiple stressors that they encounter in daily life (Gary, Yarandi, & Hassan, 2015; Keyes, Barnes, & Bates, 2015; Pratt & Brody, 2014). Researchers have reported that Blacks are more likely to report depressive symptoms, but may not receive the necessary treatment for the condition (US Department of Health and Human Services, Office of Minority Health, 2014).

The BDI has been challenged regarding its appropriateness in use in African Americans since it was developed using primarily young white men and women in Canada (Beck, Steer, & Brown, 1996; Sashidharan, Pawlow, & Pettibone, 2012). The dangers of using a psychological instrument on subjects that it was not initially designed for are emphasized in another assessment measure. The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) (Whatley, Allen, & Dana, 2003), other researchers (Joe, Woolley, Brown, Ghahramanlou-Holloway, & Beck, 2008), and the American Psychological Association's Code of Conduct (American Psychological Association, 2017) have illuminated these concerns. Women of African descent are overrepresented in the lower socioeconomic groups, and it might be hypothesized that stress in their daily lives could help to create depressive symptoms and other physical conditions such as obesity, hypertension, and cardiovascular disease (Senteio & Veinot, 2014; Thakur et al., 2014). Access to quality health care is not easily attained, and health insurance might be limited or unavailable (Miller, Kirk, Kaiser, & Glos, 2014; Thakur et al., 2014). Issues that are related to health literacy (Coughlin, Matthews-Juarez, Juarez, Melton, & King, 2014; Guo et al., 2014; James, Harville, Efunbumi, & Martin, 2014; Song et al., 2014) and cultural relevance (Coughlin et al., 2014; Craig et al., 2014) during the clinical encounter and decision-making processes (Smedley, Stith, & Nelson, 2003; United States Department of Health and Human Services Mental Health-The Office of Minority Health, 2016) might also be compromised.

Depression, Culture, and Beliefs

Even though the women are of African descent, there is a tendency to address all of them as one homogeneous group. They differ according to geographical locale and other variables. For example, the U.S. Virgin Islands (Caribbean) women have a unique national heritage, including their historical and sociopolitical realities (Callwood, Campbell, Gary, & Radelet, 2012; Woodward, Taylor, Abelson, & Matusko, 2013). People were brought to the Islands during the slave trade, which was owned by several countries, including the Dutch and the British. People of African descent make up about 74 % of the islands' population (Afro-Caribbean). They have some control of policies, laws, and cultural norms that influence their daily decision making, and they are active at all levels of the socio-political hierarchies (Taylor et al., 2017; Vickerman, 2001). Caribbean Blacks, in general, are socialized to perceive their African descent as standard and routine, and race might not be at the center of determining social status and privilege (Callwood et al., 2012; Taylor et al., 2017; Vickerman, 1999). However, they may also experience limited human and material resources for all strata of the population. On the other hand, women of African descent in the rural south (Florida), and their families have endured and survived centuries of structural, economic, and gender discrimination. Results have produced low-quality education, inferior housing, and limited opportunities for meaningful employment and well-being (Byrd & Clayton, 2002; Weaver, Himle, Taylor, Matusko, & Abelson, 2015). Over time, they have relied on their social support systems and their faith (Atkins, 2016). Much like the women in the US Virgin Islands, they represent a variety of mores and folkways. Southern women may continue to experience and perceive encounters with discrimination, and their employment status might be one of the variables that are associated with the coping approaches that they take when managing stress (Gary, Yarandi, et al., 2015). Urban women (Ohio) of African

descent are linked to a southern history that includes migration to the north and Midwest seeking work opportunities, and to escape the harshness of their lived experiences in the south. The great migration of Blacks from the south is one of the largest national internal human movements that have ever occurred in the United States (Zimmer, 2016). Many women of African descent who reside in urban Midwest communities are still tied to their southern roots and families (Wilkerson, 2016).

Literature Review

Beck Depression Inventory (BDI)

Several screening measures are commonly used to detect symptoms of depression. Among them are the Center for Epidemiologic Studies Depression (CES-D) Scale (Radloff, 1977), the Hamilton Depression Scale (Hamilton, 1960) and the BDI-II (Ball & Steer, 2003; Beck, Steer, & Garbin, 1988; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The latter is a 21-item self-report measure considered to be one of the most widely used screening measures for the detection of depressive symptoms. It can be self-administered to adolescents and adults with and without histories of psychiatric illness. The measure focuses on depressive symptoms that have occurred over the preceding two weeks (Beck et al., 1996). The BDI developed its validity and reliability from large data sets generated from individuals with and without psychiatric disorders (Beck, Steer, & Brown, 1996; Beck et al., 1988). Factor structures have been reported, and they consist primarily of a three-factor construction, which delineates negative attitudes toward the self, somatic features, and functional impairment (Beck et al., 1988).

Beck Depression Inventory-II (BDI-II)

A revised BDI-II was published in 1996 and was designed to complement the criteria as delineated in the Diagnostic and Statistical Manual for Mental Disorders-IV (DSM-IV) (American Psychiatric Association, 1996). The measure contains 21 items, with four statements related to each of the items, and is designed to incorporate the increasing levels of severity of a particular symptom that might have been experienced over the past two-week period. Four items were deleted from the BDI-II: weight loss, body image change, somatic preoccupation, and difficulty with work. Four new items were inserted into the BDI-II: agitation, a feeling of worthlessness, difficulty with concentration, and energy loss. Two other items were re-worded—sleep and appetite—and now the respondent can designate if there has been a rise or a reduction in the intensity of symptom expression. The BDI-II can be administered to adolescents, adults, and the elderly, and completed in about 5–10 minutes. This instrument is commonly used by primary health providers and mental health specialists (Beck, Steer, & Brown, 1996; Di Benedetto, Lindner, Hare, & Kent, 2006; Dozois, Covin, & Brinker, 2003).

BDI-II Psychometric Properties

There are, however, strong psychometric properties associated with the BDI-II. When this measure was administered to college students, and other populations, high internal consistency coefficients ($\alpha = 0.92$ and 0.93) with test-retest reliability of ($r = 0.93$) were documented. The sample of 500 people with psychiatric diagnoses included 317 women

(63%) and 183 men (37%). Beck et al. reported good convergent and discriminate validity when correlations were made with other standard measures. The factor structure of the BDI-II revealed two mechanisms—cognitive symptoms and somatic-affective symptoms. In addition to the sample of 500 adults with psychiatric diagnoses, for comparative purposes, the measure was administered to 120 college students considered to be normal participants. All college students were enrolled in an introductory college course at a university in Fredericton, Canada, and included predominately White participants (Beck, Steer, & Brown, 1996). In a classroom setting, the subjects (67, 57% women; 53, 44% men) reported a mean age of 19.58 years, with a coefficient alpha of .93.

In general, African Americans have made up about 1-10% of the sample in preliminary BDI-II studies (Buckley, Parker, & Heggie, 2001). Few studies were found in the literature that delimited the factor structure of the BDI-II for midlife women of African descent (residing in the South, the Midwest, and the U.S. Virgin Islands), either individually or collectively (Gary & Yarandi, 2004a). This research will help to address the gap in the science.

The purpose of this study was to determine the factor structure of the BDI-II when administered to a sample of midlife women (aged 40-65) of African descent who resided in three distinct geographical regions of the United States.

Factor Structure of the BDI-II

The factor structure of the BDI-II included for the most part White populations, and it has not been validated with the worldview and lived experiences of minorities in the United States (e.g., Hispanics, Asians, Native Americans, and Alaska Natives). Importantly, for this research, it has not been adequately validated with the lived experiences of people of African descent, whose histories of struggles are distinctly different from their White counterparts (Dinwiddie, Gaskin, Chan, Norrington, & McCleary, 2013; Hamm, 2014; Quillian, 2012). Questions arise about the lack of data to support the sensitivity and specificity of the instrument (Homaifar et al., 2009). Hence, there are sparse empirical data in the scientific literature about the BDI-II and people of African descent and other minority groups. Collectively, these minority groups comprise about 14 percent of the national population (United States Census Bureau, 2010). It has been projected that by the year 2050, minority groups will become the majority population (United States Census Bureau, 2010). It is of interest to note that from the years 1948 to 2000, Beck and his colleagues published about around 400 articles about mental health issues (Beck Institute, 2002). Regarding racial and ethnic configurations, the sample consisted of Whites ($n = 454$, 91%), African Americans ($n = 21$, 4%), Asian Americans ($n = 18$, 4%), and Hispanics ($n = 7$, 1%). The sample did not include individuals from other minority groups such as Native Americans and Alaska Natives, or Native Hawaiians and Pacific Islanders (Beck, Steer, & Brown, 1996; Gary & Yarandi, 2004a; Gary & Yarandi, 2004b). However, from among these articles, only one paper addressed the factor structure of depressive symptoms which was based on a sample of African American men who were diagnosed as alcoholics (Steer, Shaw, Beck, & Fine, 1977).

Lacking data on the minorities above, these gaps in the scientific and clinical literature may have omitted culturally competent approaches to evidence-based and patient-centered care. Such omission could also be related to the poor quality of care and mental health disparities among people of African descent in the United States, which is well documented (Dinwiddie et al., 2013; Smedley et al., 2003).

Methods

This study is one component of a larger investigation involving women of African descent about their knowledge, health beliefs and practices, and well-being (Gary, Still, Mickels, Hassan, & Evans, 2015; Gary & Yarandi, 2004a; Still, Gary, McDonald, & Yarandi, 2014). Institutional review boards at three universities approved the study. The study methods were similar across the three sites. For example, all women were approached by the researchers and asked about their interest in participating in a face-to-face interview about their health. After a thorough explanation about the study, if the women agreed to participate, they were requested to sign two copies of the informed consent form. A copy of the consent form was placed in an envelope and given to them. The second copy remained with the researchers. Also, all of the women lived within a range of 1–50 miles from a research university. The women in the U.S. Virgin Islands were recruited from all three islands, St. Croix, St. Thomas, and St. John.

Procedure

The data about the BDI-II was extracted from a parent study that queried these three groups of women about their knowledge and beliefs, related to health and well-being, and their self-reported perceptions about their health status. The researchers determined that face-to-face interviews with primarily professional nurses would be the best approach for collecting accurate and complete information. All women (n = 536) who were approached about the study agreed to participate in a thorough discussion guided by the informed consent had been discussed with them. After the written informed consent form had been signed, the one-hour interview began. The women were residents of a Southern rural community (n = 206), a Midwestern urban community (n = 200), and an eastern Caribbean islands community (n = 163). All women met the criteria of having lived in their communities for a minimum of five years.

Training the nurse interviewers was implemented in the same manner across the three communities. The principal investigator was involved with the training at each of the sites, and also assisted with data collection across the three sites. Most of the nurse interviewers were volunteers and were members of their professional nurse organizations. At the rural site, two volunteer graduate students and one paid project staff member assisted with the data collection. At all three locations, the researchers placed flyers about the study in churches, convenience stores, beauty salons, schools, neighborhood centers, and health centers in areas where women of African descent were employed primarily as service workers. Data were collected at a variety of locations, including the churches, a community leader's home where a research house party was organized, laundry mats, at universities

located at each of the three sites, and at truck stops, libraries, and even under shade trees in rural and island communities. Data collection also occurred in the participants' homes.

In all other instances, the private interview appointments were made with the women by telephone and during face-to-face contacts with them in other settings. The researchers made a special effort to protect the women's confidentiality. In simple terms, the researchers discussed with the women how all research related information would be stored and later analyzed. The women often asked numerous questions about how their information would be used and for what purposes. These and all other queries were carefully answered before the interviews began. At the end of the interview, each woman was given \$20.00 as a token of the researchers' appreciation for their participation.

Early on, the researchers decided to read aloud all of the items of the measure in the study. In fact, the researcher and the women sat side-by-side to increase the ease with which the research items could be read for both parties. This process was chosen for several reasons: to remove any apprehension the women might have had about their deficits in comprehending the items on the measures, to alleviate the need to ask or test the women's reading levels or their health literacy, and to ensure that the data would be accurately recorded. Also, while researchers might be familiar with Likert scales and their advantages, women of African descent might not be conversant with the scale and they could under report their symptoms by selecting the least controversial responses (Ezisy, 2017). The stigma that is associated with reporting or participating in mental health treatment remains a major obstacle for the identification of mental health related symptoms (Gary, Still, et al., 2015; Gary, 2005; Williams, 2011). At the end of the face-to-face interview, the women were given culturally appropriate health- related information about hypertension, diabetes, heart disease, depression, and anxiety, and a list of the health care resources in their respective locales. None of the women self-reported that they were receiving mental health services at the time the interviews occurred.

Measures

This study is based on three groups of African American women who resided in three different regions in the United States and were administered the following measures: Patient Satisfaction with Health Care Decisions; an adapted version of this measure was used to collect data on the sociodemographics, health status, and other related domains that were pertinent to the study. The alpha coefficient of the measure ranged from .82 to .91 (Holmes-Rovner et al., 1999) and the Hassles in your Life Instrument (Marziali, 1987). Additional measures were used at the Midwestern site, where we also administered the Charleston Comorbidity Index (CCI) (Charlson, Pompei, Ales, & MacKenzie, 1987) that was adapted for this study. In addition, other instruments administered were the Perceived Genetic Knowledge and Attitudes (PGKA) (Morren, Rijken, Baanders, & Bensing, 2007; Still et al., 2014), the SF-8 Health Survey (Turner-Bowker, Bayliss, Ware, & Kosinski, 2003), and the BDI-II (Ball & Steer, 2003; Beck, Steer, Ball, & Ranieri, 1996). The latter measure, the BDI-II, is the focus of this research paper and was administered at the three sites. The measure presents the respondent with 21 items, each consisting of four self-evaluative statements that describe symptom severity and are coded along an ordinal continuum

ranging from absent or mild (scored as 0) to severe (scored as 3). The scores from the 21 items are summed to yield a total value that can range from 0 to 63. According to the BDI-II Manual (Beck, Steer, & Brown, 1996), depression scores are interpreted as 0–13, minimal; 10–16, mild; 17–29, moderate; and 30–63, severe. Advantages of the BDI-II are that it is a self-administered inventory, uses simple language, and is easy to score. The 21 depressive symptoms and attitudes included in the BDI-II are (1) sadness, (2) pessimism, (3) past failure, (4) loss of pleasure, (5) guilty feelings, (6) punishment feelings, (7) self-dislike, (8) self-criticalness, (9) suicidal thoughts or wishes, (10) crying, (11) agitation, (12) loss of interest, (13) indecisiveness, (14) worthlessness, (15) loss of energy, (16) changes in sleeping pattern, (17) irritability, (18) changes in appetite, (19) concentration difficulty, (20) tiredness or fatigue, and (21) loss of interest in sex. These items are based on verbal descriptions reported by patients about their current mental state, and they are not based on a particular theory of depression (Beck, Steer, & Brown, 1996; Zhang & Gary, 2013).

Data Analysis

Demographic characteristics have been summarized as mean and standard deviation (SD) or frequency and percentage scores, as applicable. One-way ANOVA was used to determine the difference in mean age and mean BDI-II total scores among the three groups. Analysis of frequency was used to test the homogeneity of the three groups concerning marital status, employment status, income, education, self-reported health status, and BDI-II classifications. Since this is the first study that the BDI-II was administered to samples of women of African ancestry living in three different regions of the United States, an exploratory factor analysis, rather than confirmatory factor analysis, was employed. An iterated principal-factor analysis was performed, in which squared multiple correlations were used for the initial communality estimates, and a Promax (oblique) rotation was used to identify the self-reported dimensions of depression. The minimum 80% variance criterion and the scree plot were used to determine the optimal number of factors. Concerning the adequacy of the sample size for performing factor analysis, the most conservative estimate of sample size indicates the necessity for about ten times as many observations as there are variables to be analyzed (Hatcher, 1994). The sample size ($n = 533$) for this study exceeded this bench mark. The internal consistency of scales was estimated using Cronbach's coefficient alpha. The significance level was set at a p -value equal to or less than 0.05. All statistical analyses were carried out using SAS (Version 9.4).

Results

The data consisted of three groups of African American women residing in different parts of the United States: Florida Sample ($n = 206$), Ohio Sample ($n = 201$) and US Virgin Island sample (USVI, $n = 126$). As indicated in Table 1, the mean age for the total sample was 51.51 years ($SD = 8.78$). The mean age of the AAW for the Florida, Ohio, and USVI were 48.09, 53.67, and 55.26 years, respectively; the difference in mean age among the three groups was statistically significant ($F = 32.27$, $p < 0.0001$). More than 37% the participants were married; Ohio and USVI participants had the lowest and highest percent (31.34% vs 44.44%, respectively) of being married; however, the distribution of marital status among the three groups was statistically non-significant (chi-square = 11.34, $p = 0.1832$). Almost 66%

of participants were employed full-time (Table 1): Florida Group had the highest (74.27%) and USVI had the lowest (59.52%) percent of full employment; the three groups were not homogeneous concerning employment status (chi-square = 25.28, $p = 0.0003$).

The median household income was \$28,108, which is notably lower than the \$51,371 inflation-adjusted median household income in the United States for the year 2012 (Noss & Unites States Census Bureau, 2013). There was a significant difference in income distribution among the three groups (chi-square = 98.07, $p < 0.0001$). The USVI participants' median income was the highest (\$37,500), and the Florida participants had the lowest median income (\$18,611). The majority (58%) of the participants had an education that exceeded the high school level. The educational attainment was significantly different between the three groups (chi-square = 62.98, $p < 0.0001$); 75.13% of the Ohio participants had education levels beyond high school, while only 41.74% of Florida participants' education exceeded the high school level. About 58% of the participants classified their health as "good," (Table 1) and about the same percentage was self-reported by the three groups; thus, it can be concluded that the participants were homogenous concerning their self-reported health status (chi-square = 2.21, $p = 0.8993$).

The mean total score for the BDI-II was 7.08 (SD = 6.96); the USVI group had the lowest and Ohio group the largest mean scores; however, the mean total BDI-II score among the three groups was not statistically significant ($F = 2.72$, $p = 0.0667$). Based on the cutoff scores and interpretive labels, 456 participants (85.55%) scored in the minimal range (0–13), 44 (8.26%) in the mild range (14–19), 24 (4.50%) in the moderate range (20–28) and 9 (1.69%) in the severe range (29–63) (Table 1). The difference in BDI-II classification among the three groups was not statistically significant (chi-square = 8.90, $p = 0.1790$).

The coefficient alpha of the BDI-II for the total sample was 0.87, suggesting that the BDI-II exhibited a high level of internal consistency for the study sample. All the corrected item-total correlations for the 21 BDI-II items were significant after a Bonferroni adjustment ($\alpha/21$) was used to control for the experiment-wise (overall) error rate. The correlation coefficients ranged from 0.34 (concentration difficulty) to 0.59 (loss of pleasure) (Table 2). Kaiser's measure of sampling adequacy for the partial correlation matrix of the 21 items was 0.91, a value that Kaiser considered extremely high and desirable (Cerny & Kaiser, 1977).

An alpha factor analysis was conducted to confirm what number of factors to extract. The estimated coefficient alphas for the factors suggested that the first two common factors were potentially reliable for this sample. The coefficient alphas for the two factors were 0.83 and 0.80, respectively.

The two extracted factors explained 96% of the common variance. Two comparably sized eigenvalues of 5.14 and 4.81 were found for the reduced correlation matrix, and the inter-factor correlation was 0.63. The pattern matrix of the standardized regression coefficients loading on the two Promax-rotated extracted factors are presented in Table 3 for the total sample and in Tables 4, 5, and 6 per group by location. Symptoms such as punishment feelings, pessimism, self-dislike, past failure, suicidal thoughts or wishes, self-criticalness, sadness, indecisiveness, worthlessness and guilty feelings tended to load high on the first

factor. All these symptoms were psychological and cognitive in nature. Therefore, Factor I was a cognitive dimension of self-reported depression. Factor II explained somatic symptoms such as tiredness or fatigue, changes in sleeping pattern, loss of energy, irritability, changes in appetite, loss of pleasure, and agitation. Such factors were thought to represent a “somatic-affective” dimension of self-reported depression. The individual group factor pattern is shown in Table 4. Although each group factor pattern indicated a two-factor solution, the priority of the items within a factor between groups was quite different. For example, among the items representing the somatic symptoms, the item “Tiredness or Fatigue” had the highest loading (0.76) for the Florida group. On the other hand, the highest loadings of the somatic symptoms for the Cleveland and USVI groups were “Irritability” (0.65) and “Loss of Pleasure” (0.73), respectively (Table 4).

The two extracted factors explained 96% of the common variance. Two comparably sized eigenvalues of 5.14 and 4.81 were found for the reduced correlation matrix, and the inter-factor correlation was 0.63. The pattern matrix of the standardized regression coefficients loading on the two Promax-rotated maximum-likelihood factors is presented in Table 3. Symptoms such as punishment feelings, pessimism, self-dislike, past failure, suicidal thoughts or wishes, self-criticalness, sadness, indecisiveness, worthlessness, and guilty feelings tended to load high on the first factor. All these symptoms were psychological and cognitive in nature. Therefore, Factor I was a cognitive dimension of self-reported depressive symptoms. Factor II explained somatic symptoms such as tiredness or fatigue, changes in sleeping pattern, loss of energy, irritability, changes in appetite, loss of pleasure, and agitation. Such factors were thought to represent a “somatic-affective” dimension of self-reported depressive symptoms. Tables 4, 5, and 6 indicate the factor matrix for individual groups.

Discussion and Recommendations

The purpose of this study was to determine the factor structure of the BDI-II of three groups of midlife women of African descent aged 40–65 years residing in the South (Florida), the Midwest (Ohio), and in the U.S. Virgin Islands. Sample characteristics across the three groups indicated that the majority were married, employed full-time, had completed high school and self-reported good health status. The Florida group had an annual income of less than \$15,000 per year. Most of the women ($n = 456$) reported minimal levels of depression as reported on the BDI-II.

This research was conducted through community contacts and linkages which, by design, did not include clinic populations. Our intent was to determine how the BDI-II would perform as a screening measure among this specific ethnic marginalized population who reside in these three locations. Findings suggesting that the majority of the women reported minimal levels of depression were not expected. Implications of the presence of depression in nonclinical groups and the extent to which women of African descent might be at risk, but not identified and treated for depression, is reason for concern.

There are a self and public stigma in the African American community related to acknowledging mental health problems.(Gary, 2005) The National Institutes of Health has

suggested that stigma about mental health is one of the most significant barriers to help-seeking for this vulnerable group (Knaak, Mantler, & Szeto, 2017). African American women who participated in research with the National Alliance for Mental Illness (NAMI) reported that their emotions, which could be linked to depression, were regarded as “evil” or “acting out”(Hamm, 2014). The normalization of depression has also been reported during a study by Mental Health of America. In the study, 56 percent of African Americans felt that depression was normal (Hamm, 2014). Along with stigma, there is a stereotype that African American women in particular need to be strong and are not allowed to express “weak” emotions. These beliefs and perceptions might help to contribute to the low utilization of mental health services (Hamm, 2014). When mental health services are sought out, there could also be stigma from therapists who have been reported to express racism and micro aggressions toward African American clients (Williams, 2013).

Our findings do not suggest that the BDI-II has the needed specificity and sensitivity to detect at-risk groups in this population. Questions about the efficacy of this measure have been raised by other researchers (Sashidharan et al., 2012). In their 2012 study, they examined whether the BDI-II contained racial bias. Although they did not conclude there was any racial bias in the study, they did find flaws in the efficacy of its design.

Overgeneralizing the use of the BDI-II can cause different outcomes for different populations. However, the factor structure that we propose for our current findings are similar to our earlier proposed nomenclature of “critical self-appraisal and deregulation of arousal,” indicating cognitive and somatic-type self-reported symptoms (Gary & Yarandi, 2004a), and they also corroborate findings suggested by Zhang & Gary (2013).

High correlations exist around the loss of pleasure as reported by all of the women. This finding has implications for quality of life and well-being (Assari, Burgard, & Zivin, 2015) and perhaps it is an antecedent for more severe levels of depression (DSM-5, 2013). Of note is the fact that the majority of the women were employed, but some with marginal incomes to support themselves and their families.

Among the three groups, Factor I loadings—critical self-appraisal—exposed that the women’s feelings of punishment, pessimism, self-dislike, past failures, and suicidal thoughts are barriers to experiencing meaningful quality-of-life thoughts and behaviors. Similarly, Factor II loadings—deregulation of arousal—is evident through reported somatic symptoms, including tiredness and fatigue, loss of energy, and irritability. People who have chronic medical conditions are at increased risk for depressive symptoms and can put patients at two to three times greater risk (Meader et al., 2011). Their findings are corroborated by our results of the research. Somatic-type reports about health status could serve as a suspicion that alerts health care providers to the need for further exploration about depressive symptoms among women of African descent. Gallo (Gallo & Matthews, 2003)has linked low education and income to depression, and almost twenty years later this framework is evident from our findings. The United States Department of Health and Human Services Office on Minority Health states that the Africans Americans report having serious psychological distress 10% more than non-Hispanic Whites and yet are 9.4% less likely to receive treatment and 9.1% less likely to receive prescription drug treatment or counseling

(United States Department of Health and Human Services Mental Health-The Office of Minority Health, 2014). These issues should be examined further in future research that proposes culturally relevant interventions.

A brief perusal of each of the three groups provides insight into common and specific findings. The Florida (Southern site) women reported somatic expressions of symptoms (Factor I) such as tiredness and fatigue, loss of energy, and irritability. Cognitive (Factor II) symptoms included pessimism, worthlessness, and punishment feelings. When the two sets of symptoms are combined, it is hypothesized that the women are confronting serious barriers to a high quality of life. The Floridian women were more likely not to finish high school, earned less money and were more likely to be employed with health insurance than the Cleveland or U.S. Virgin Island groups, yet they had a higher BDI score.

The Ohio (Midwestern site) women, on the other hand, reported cognitive symptom (Factor I) loadings, with suicidal thoughts, past failures, and self-dislike having some of the highest loadings. The thoughts about suicide were not expected. The socioeconomic disparity, for example, has always been present among women of African descent. Other lines of inquiry must be investigated, including the impact of chronic stress and its many dynamics (Keyes, Barnes, & Bates, 2011), prejudice and discrimination (Byrd & Clayton, 2002), and centuries of alienation and marginalization (Smedley et al., 2003). Other areas of inquiry could include family cohesion and support, which has waned over the past few decades. Factor II somatic symptoms, including changes in sleep patterns, loss of energy, tiredness and fatigue, points to the need to query women in this population about this category of reported symptoms. Health professionals should be aware of the preferred and frequently used language of the women, regardless of their geographic location of residence.

Women in the U.S. Virgin Islands self-reported cognitive (Factor I) symptoms, including a sense of punishment, self-criticism, self-dislike, and guilt feelings. These findings closely mirror the reported symptoms from among the Ohio group, but suicide was not as prominent. Somatic symptoms (Factor II) also more closely mirrored the Ohio group, and also included, for instance, disturbance in sleep patterns, irritability, loss of energy, and tiredness. Some of these findings were somewhat unexpected. First, the U.S. Virgin Islands is relatively autonomous about culture and politics and the majority of the population are people of African descent, but there is a long history of colonialism and foreign dominance embedded within the culture (Central Intelligence Agency, 2017). This factor might be one of the links that could help to explain the similarities among and across the groups. The other concern that impacts the three groups is related to the stigma of mental illness which often inhibits individuals from acknowledging and seeking health services (Corrigan, Druss, & Perlick, 2014; World Health Organization, 2017a). Finally, the perception of the availability of mental health services, early detection of illness states, and the benefits that can be gained from receiving care is not well understood among people of African descent. For example, Grothe began work on studying the validity of the BDI in low-income African Americans and found that the studies using the BDI-II included no more than 15% of African Americans in each sample (Grothe et al., 2005) which might make the identification and detection of depressive symptoms difficult to decipher. Additionally, the underestimation of rates of depression in African American communities resulting from

selection bias in the main studies has contributed to the lack of understanding of the use of mental health services among people of African descent (Barnes, Keyes, & Bates, 2013; Bryant, Haynes, Kim Yeary, Greer-Williams, & Hartwig, 2014; Gary, Yarandi, et al., 2015).

Several limitations are associated with this research. The generalizability of these findings is impacted by the participants who agreed to be included in the study. Perhaps some of the women supported the concept of depression, while others might have rejected it as being a concept that was alien to their personal worldview. Also, the participants were women, and cannot be generalized to men of African descent, nor can the findings be applied to younger women who are not yet in midlife. Despite these limitations, there are lessons that can be learned. The findings from this research could be applied in a more general manner. Several recommendations are presented that are related to the findings in this study:

- The measures that are used to determine risks of depression may not be sensitive enough to capture the emotional and psychological levels of severity evident among the women
- The self-reporting of thoughts such as suicidal behaviors, pessimism, and self-criticism are debilitating and need to be addressed through community-based interventions that are culturally and linguistically appropriate for each of the three groups of women.
- Understanding the specific cultural worldviews of the women, in their settings, might help to provide a more relevant and useful understanding of the stressors that they encounter and their responses to them.
- The differentiation between physical symptoms that might be related to some other illness or the expressions of depressive symptoms ought to be carefully explored. As a beginning point, however, health care providers can explore the nature of the manifestations of being tired, or changes in sleeping or eating patterns, in more depth to determine if depressive symptoms are evident.

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Table 1

Sample Characteristics

Variable	Total Sample (n = 533)		Florida (n = 206)		Cleveland (n = 201)		USVI (n = 126)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age (in years)	51.51	8.78	48.09	6.45	52.67	8.75	55.26	10.07
BDI-II Total Score	7.08	6.96	7.80	7.73	7.29	6.61	5.55	5.95
Variables	N	%	N	%	N	%	N	%
Marital Status								
Married	199	37.34	80	38.83	63	31.34	56	44.44
Divorced	118	22.14	45	21.84	51	25.37	22	17.46
Single (never married)	142	26.64	49	23.79	59	29.35	34	26.98
Widowed	51	9.57	19	9.22	20	9.95	12	9.52
Separated	23	4.32	13	6.31	8	3.98	2	1.59
Employment Status								
Employed full-time	351	65.85	153	74.27	123	61.19	75	59.52
Employed part-time	39	7.32	7	3.40	23	11.44	9	7.14
Not Employed	66	12.38	23	11.17	31	15.42	12	9.52
Other	77	14.45	23	11.17	24	11.94	30	23.81
Household Annual Income								
Under \$10,000	58	10.88	31	15.05	20	9.95	7	5.56
\$10,000 - \$14,999	72	13.51	47	22.82	10	4.98	15	11.90
\$15,000 - \$19,999	56	10.51	36	17.48	11	5.47	9	7.14
\$20,000 - \$24,999	58	10.88	26	12.62	21	10.45	11	8.73
\$25,000 - \$29,999	37	6.94	7	3.40	22	10.95	8	6.35
\$30,000 - \$34,999	34	6.38	10	4.85	15	7.46	9	7.14
\$35,000 - \$39,999	29	5.44	9	4.37	12	5.97	8	6.35
\$40,000 - \$49,999	56	10.51	20	9.71	22	10.95	14	11.11
\$50,000 - \$99,999	101	18.95	18	8.74	45	22.39	38	30.16

Variable	Total Sample (n = 533)		Florida (n = 206)		Cleveland (n = 201)		USVI (n = 126)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
\$100,000 or above	32	6.00	2	0.97	23	11.44	7	5.56
Education								
Less than high school	75	14.07	40	19.42	16	7.96	19	15.08
High School	142	26.64	79	38.35	30	14.93	33	26.19
Greater than high school	103	19.32	32	15.53	50	24.88	21	16.67
Community college	80	15.01	26	12.62	40	19.90	14	11.11
Bachelor's Degree	73	13.70	21	10.19	32	15.92	20	15.87
Master's Degree	45	8.44	6	2.91	23	11.44	16	12.70
Doctorate	8	1.50	1	0.49	6	2.99	1	0.79
Other	7	1.31	1	0.49	4	1.99	2	1.59
Self-Reported Health Status								
Poor	17	3.19	6	2.91	8	3.98	3	2.38
Fair	140	26.27	57	27.67	51	25.37	32	25.40
Good	310	58.16	121	58.74	117	58.21	72	57.14
Excellent	66	12.38	22	10.68	25	12.44	19	15.08
BDI-II Classification								
Minimal	456	85.55	167	81.07	175	87.06	114	90.48
Mild	44	8.26	22	10.68	13	6.47	9	7.14
Moderate	24	4.50	13	6.31	10	4.98	1	0.79
Severe	9	1.69	4	1.94	3	1.49	2	1.59

Table 2

Means, Standard Deviation, and Corrected Item-Total Correlations (Cronbach's Alpha = 0.87)

	Mean	SD	Corr
Sadness	0.27	0.55	0.56
Pessimism	0.14	0.41	0.47
Past Failure	0.19	0.52	0.47
Loss of Pleasure	0.32	0.54	0.59
Guilty Feelings	0.20	0.42	0.49
Punishment Feelings	0.18	0.56	0.53
Self-Dislike	0.15	0.43	0.52
Self-Criticalness	0.24	0.55	0.54
Suicidal Thoughts or Wishes	0.04	0.25	0.42
Crying	0.32	0.79	0.52
Agitation	0.49	0.83	0.45
Loss of Interest	0.27	0.54	0.53
Indecisiveness	0.26	0.56	0.56
Worthlessness	0.23	0.56	0.45
Loss of Energy	0.45	0.62	0.50
Changes in Sleeping Pattern	0.71	0.85	0.50
Irritability	0.45	0.64	0.51
Changes in Appetite	0.45	0.66	0.40
Concentration Difficulty	0.53	0.87	0.35
Tiredness or Fatigue	0.52	0.70	0.56
Loss of Interest in Sex	0.68	0.90	0.36

Table 3

Factor Matrix (n = 533) Total Sample

Symptom	Factor I	Factor II
Punishment Feelings	0.69	−0.03
Pessimism	0.62	−0.04
Self-Dislike	0.60	0.03
Past Failure	0.58	−0.01
Suicidal Thoughts or Wishes	0.55	−0.04
Self-Criticalness	0.51	0.12
Sadness	0.49	0.17
Indecisiveness	0.44	0.24
Worthlessness	0.43	0.12
Guilty Feelings	0.42	0.18
Tiredness or Fatigue	−0.01	0.66
Changes in Sleeping Pattern	−0.04	0.62
Loss of Energy	−0.01	0.59
Irritability	0.06	0.55
Changes in Appetite	−0.03	0.49
Loss of Pleasure	0.21	0.48
Agitation	0.13	0.40
Loss of Interest	0.28	0.34
Crying	0.30	0.30
Loss of Interest in Sex	0.16	0.27
Concentration Difficulty	0.04	0.24

Table 4

Factor Matrix (n = 206), Florida Group

Symptom	Factor I	Factor II
Tiredness or Fatigue	0.76	−0.03
Loss of Energy	0.62	−0.07
Irritability	0.58	0.12
Concentration Difficulty	0.56	0.13
Changes in Appetite	0.55	−0.01
Changes in Sleeping Pattern	0.53	0.15
Loss of Interest in Sex	0.51	−0.07
Loss of Pleasure	0.44	0.27
Crying	0.37	0.23
Agitation	0.35	0.27
Pessimism	−0.22	0.81
Worthlessness	−0.12	0.74
Punishment Feelings	0.03	0.65
Sadness	0.17	0.47
Self-Dislike	0.14	0.46
Indecisiveness	0.21	0.45
Loss of Interest	0.25	0.43
Past Failure	0.12	0.41
Guilty Feelings	0.28	0.35
Self-Criticalness	0.20	0.33
Suicidal Thoughts or Wishes	0.17	0.29

Table 5

Factor Matrix (n = 201), Ohio Group

Symptom	Factor I	Factor II
Suicidal Thoughts or Wishes	0.81	−0.23
Past Failure	0.68	−0.08
Self-Dislike	0.66	0.04
Punishment Feelings	0.60	0.01
Guilty Feelings	0.58	−0.01
Self-Criticalness	0.57	0.07
Indecisiveness	0.55	0.20
Pessimism	0.48	0.15
Loss of Interest in Sex	0.46	0.11
Sadness	0.40	0.29
Worthlessness	0.37	0.26
Crying	0.33	0.25
Irritability	−0.01	0.65
Changes in Sleeping Pattern	−0.12	0.64
Loss of Energy	0.11	0.52
Tiredness or Fatigue	0.20	0.49
Loss of Interest	0.11	0.48
Loss of Pleasure	0.25	0.46
Agitation	0.02	0.43
Changes in Appetite	0.16	0.39
Concentration Difficulty	−0.21	0.28

Table 6

Factor Matrix (n = 126), USVI Group

	Factor I	Factor II
Punishment Feelings	0.86	−0.02
Self-Criticalness	0.81	−0.06
Self-Dislike	0.79	−0.13
Guilty Feelings	0.68	0.03
Past Failure	0.67	0.06
Suicidal Thoughts or Wishes	0.63	−0.04
Sadness	0.49	0.25
Crying	0.48	0.27
Pessimism	0.46	0.23
Agitation	0.27	0.16
Concentration Difficulty	0.21	−0.11
Loss of Pleasure	−0.03	0.73
Changes in Sleeping Pattern	−0.12	0.63
Irritability	−0.02	0.62
Loss of Energy	0.11	0.54
Loss of Interest In Sex	−0.13	0.51
Loss of Interest	0.23	0.48
Indecisiveness	0.17	0.47
Worthlessness	0.14	0.46
Tiredness or Fatigue	0.04	0.44
Changes in Appetite	−0.06	0.42