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Associations Among Depressive Symptoms, Wellness, Patient Involvement, Provider Cultural Competency, and Treatment Nonadherence: A Pilot Study Among Community Patients Seen at a University Medical Center

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Abstract Treatment nonadherence is a pernicious problem associated with increasing rates of chronic diseases, escalating healthcare costs, and rising mortality in some patients. Although researchers have suggested numerous factors related to treatment nonadherence, several understudied aspects warrant attention, such as primary-care settings, provider cultural competence, and patient involvement. Adding to the research base, the present pilot study examined 88 primarily Black American and White American community patients from a large university medical center in the southern part of the United States. The study explored two research questions: (a) To what extent are there associations among depressive symptoms, wellness, patient involvement, cultural competency, and treatment nonadherence in a racially diverse community patient population? And (b) to what extent do the study exploratory variables and background characteristics predict treatment nonadherence, both separately and jointly? Depressive symptoms, the patient's perception of a provider's cultural competence, and marital/partnered status were found to be statistically significantly associated with treatment nonadherence, but not entirely in the directions expected.

Keywords Treatment nonadherence · Community patients · Primary-care setting · Depressive symptoms · Well-being · Patient involvement · Provider cultural competency

Introduction

The World Health Organization (WHO) has long warned that treatment nonadherence is a global problem, one growing in importance as (a) the prevalence rates of chronic diseases significantly increase, (b) the cost of health care drastically increases, and (c) individual health outcomes

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and overall functioning significantly decrease (Bosworth et al. 2016; DiMatteo et al. 2012; Sabaté 2003; Yeaw et al. 2011). Indeed, the literature has suggested that patients' failure to adhere to providers' treatment recommendations may partly explain these global problems. Empirical research has found an average of 24.8% of patients who were nonadherent to treatment (DiMatteo 2004), although WHO has estimated global nonadherence rates of 50% in developed countries (Sabaté 2003). The soaring healthcare cost associated with low treatment adherence related to common chronic diseases has been estimated at $105 billion dollars annually (DiMatteo et al. 2012; Nasseh et al. 2012).

Researchers have suggested that increasing adherence to proposed evidence-based, empirically supported treatments may have a greater impact on overall health and costs than will innovations in medical treatments (Haynes et al. 2002). For example, adherence to treatment recommendations has been linked to lower yearly medical spending and fewer days of hospital stays among patients diagnosed with chronic medical conditions (Roebuck et al. 2011; Sokol et al. 2005). Conversely, poor treatment adherence has been linked to increased mortality in patients with HIV/AIDS, diabetes, cardiovascular disease, and other medical conditions (Ho et al. 2006; McCowan et al. 2008; Vestbo et al. 2009).

Treatment adherence has been defined as the extent to which patients follow health care providers' recommendations concerning medication, diet, preventative care, lifestyle changes, and follow-up appointments (Hearnshaw and Lindenmeyer 2005; Roter et al. 1998). Researchers have suggested numerous factors that influence treatment nonadherence, including low health literacy (Kalichman et al. 1999; Nichols-English and Poirier 2000), low patient involvement (Hibbard and Greene 2013; Wilson et al. 2010), lack of social support (DiMatteo 2004; Gonzalez et al. 2004), poor mental and psychological health (DiMatteo et al. 2000; Grenard et al. 2011), and poor communication between patient and provider (Haskard Zolnierek and DiMatteo 2009).

Although studied less frequently, demographic and cultural factors also may be related to patients' willingness and ability to adhere to treatment recommendations (see Rolnick et al. 2013). Thus, as the patient population of the United States becomes more racially, ethnically, and culturally diverse (Wright et al. 2013), documented differences in rates of treatment adherence based on cultural factors must be investigated (Nguyen et al. 2009; Oh et al. 2009; Rolnick et al. 2013; Trinacty et al. 2009; Wu et al. 2012). To this end, researchers have suggested that increasing the cultural competency of health providers might affect treatment adherence in racially, ethnically, culturally, and linguistically diverse samples (Cooper-Patrick et al. 1999;

Kohn-Wood and Hooper 2014; Koh et al. 2014; Nielsen et al. 2016; U.S. Department of Health and Human Services, Office of Minority Health [OMH] 2001). However, few have explicitly studied this assertion. Researchers have also suggested that interventions delivered in primary health care settings may have a positive impact on decreasing nonadherence among culturally and racially diverse populations (Bosworth et al. 2016; Gilbody et al. 2003; Hooper 2014; Lin et al. 1995). Thus, whether and how mental health, patient involvement, and a provider's cultural competency are implicated in treatment nonadherence form gaps in the literature.

Depression, Wellness, and Treatment Adherence

Depression rates in the United States continue to increase alarmingly (Kessler and Bromet 2013). In 2012 Kessler, Petukhova, Sampson, Zaslavsky, and Wittchen estimated the lifetime prevalence rate for major depressive disorder to be 18.3%, with a lifetime morbid risk of a major depressive episode estimated at 29.9%. In comparison, data collected in 1990 and 1992 pointed to only a 17.1% lifetime prevalence rate for a major depressive episode in adult samples (Kessler et al. 1994). Major depressive disorder and depressive symptoms may have important implications for treatment adherence (Aggarwal and Mosca 2010; Gonzalez et al. 2007; Wing et al. 2002). Grenard et al. (2011) suggested that healthcare providers should identify patients with depression as being at risk for nonadherence, although more research is needed. Others have similarly suggested that the most significant issue related to depression is the problem of treatment nonadherence (Stein-Shvachman et al. 2013).

Depression and Treatment Adherence

Empirical studies have shown that depression symptomatology decreases adherence to treatment (Arrieta et al. 2012; Cukor et al. 2009; Grenard et al. 2011; Kronish et al. 2006; Siegel et al. 2007). In one study, patients diagnosed with depression were three times as likely not to adhere to treatment as the patients in the healthy control group (DiMatteo et al. 2000). Arrieta et al. (2012) found that cancer patients with comorbid depression are less likely to adhere to chemotherapy. Kronish et al. (2006) found that depressed patients are not only less likely to adhere to medication treatments, but also less likely to follow recommendations about secondary health behaviors, such as smoking cessation, exercise, and rehabilitation.

Not all studies have found a positive relation between depressive symptoms and nonadherence (Mayberry et al.

2015). Some scholars (Mayberry et al. 2015; Thompson and McCabe 2012) have found that other factors—such as comorbid medical conditions, self-efficacy, support networks, patients' views on and causes of diseases and disorders, and beliefs about treatments—might better explain the nonadherence that is often, but not always, evinced in the literature. In a systematic review of the relation between depression and nonadherence, Thompson and McCabe (2012) found a wide range of nonadherence levels: 30–60%. Researchers have suggested the need to clarify the intersection of depression, nonadherence, and patient characteristics such as race, ethnicity, marital status, and education.

Well-Being and Treatment Adherence

The construct of psychological wellness has commonly been divided into two domains: (a) cognition, or rational evaluation of one's life situation; and (b) affect, or emotional responses to one's life situation. Seminal scholar Diener has informed the clinical, assessment, and research communities about the important link between health outcomes and psychological wellness. For example, Diener, Emmons, Larsen, and Griffin (1985) identified *life satisfaction* as a component underpinning psychological wellness, defining it as a subjective assessment of one's quality of life based on an ideal.

Preliminary findings have shown that psychological wellness is related to treatment adherence (Barger et al. 2009; DiMatteo 2004; Gonzalez et al. 2004). Barger and colleagues (2009) found that high levels of well-being and emotional support are linked to increased patient treatment adherence. DiMatteo's (2004) seminal meta-analysis found that patients without emotional support have 1.35 times the risk of nonadherence compared to patients who receive emotional support. Similarly, Gonzalez et al. (2004) found that social support is positively related to treatment adherence in HIV patients. They also found that psychological well-being is associated with increased levels of treatment adherence. Exploring well-being as a factor in models of intervention delivered in primary-care settings and directed toward increasing treatment adherence is worthwhile.

Patient Involvement and Treatment Adherence

In a change from the traditional view of physicians and other healthcare providers as gatekeepers of health knowledge, patients are increasingly seeking healthcare information and partnering with providers to make treatment decisions (Bosworth et al. 2016). Patients with high involvement in their healthcare seek information about their illnesses, assert themselves in interactions with providers, and make active decisions regarding adherence to treatment recommendations (Brashers et al. 1999). Patient participation has been positively linked to treatment adherence levels (Loh et al. 2007; Naik et al. 2008; Parchman et al. 2010; Schoenthaler et al. 2009; Wilson et al. 2010). In a sample of patients diagnosed with depression, Loh et al. (2007) found that patients' participation in healthcare visits is significantly correlated with both patient- and provider-rated adherence levels. Wilson et al. (2010) found that shared decision making in asthma treatment decisions significantly affects both adherence and clinical outcomes, compared to a provider-only approach. Robinson et al. (2008) contended that patient-centered care, including participatory decision making and patients' management of their own health, is vital to increasing adherence levels. Although a nationwide survey of patient activation—that is, the extent to which patients manage their own health and health behaviors—found a large percentage of patients were highly involved in their own care (41.4%), patients from low socioeconomic and educational backgrounds were found less likely to be highly involved (Hibbard and Cunningham 2008).

Perceived Cultural Competency and Treatment Adherence

Cultural competency for a healthcare provider has been defined as having the knowledge, skills, and awareness to provide appropriate treatment recommendations to patients from diverse racial, ethnic, and cultural backgrounds (Kohn-Wood and Hooper 2014; Lucas et al. 2008; Ponterotto et al. 2002; OMH 2002). One component of cultural competency is the patient's confidence that a provider is able to treat individuals from the patient's racial and cultural background (Lucas et al. 2008; Nielsen et al. 2016). Wroth and Pathman (2006) found that patients who are not confident in their provider's cultural abilities report less adherence to treatment. Similarly, patients who feel unwelcome in a healthcare setting and those who are unsatisfied with their provider's concern are less inclined to adhere to treatment. Other cultural and systems factors that appear to be important include marital and socioeconomic status. Family and societal support has been shown to increase treatment adherence (DiMatteo 2004; DiMatteo and DiNicola 1982; Wu et al. 2012). In a meta-analysis of studies involving treatment adherence, DiMatteo (2004) found that both being married and living with another person increase adherence to treatment.

The literature has also suggested that a higher education level increases the extent to which patients are knowledgeable about their disease and therapy and decreases the extent to which patients do not adhere to treatment recommendations.

Indeed, previous studies have found a positive association between education and treatment adherence, in that patients with higher educational levels are more adherent than those with lower education levels (Apter et al. 1998; Okuno et al. 2001). In an experimental study involving 40 patients with hypertension (20 in the control group; 20 in the experimental group), Saounatsou and colleagues (2001) found that years of schooling are positively and significantly associated with treatment adherence. However, other studies have found no significant relation between education level and adherence (e.g., Jin et al. 2008).

Demographic and cultural factors are important to treatment adherence. Not surprisingly, culturally tailored health care interventions (e.g., via culturally competent health educators or community-based partnerships) have been shown to have positive effects on treatment adherence levels in racially diverse samples (Corkery et al. 1997; Kohn-Wood and Hooper 2014; McElmurry et al. 2009). One study found that patients who see more culturally sensitive counselors are more likely to continue to attend counseling sessions (Wade and Bernstein 1991). More broadly, Koh et al. (2014) and Cooper-Patrick et al. (1999) proposed that improved cultural competence among providers might lead to higher adherence levels, greater patient involvement, and higher quality of overall healthcare. Thus, explorations of the links among cultural competence, culturally tailored health care, and treatment adherence can inform the work of researchers, educators, and providers.

The Present Pilot Study

The present pilot study explored correlates and predictors of treatment nonadherence in a primary-care patient population. Given the findings described in the literature and the exploratory nature of the study, we examined two research questions:

- To what extent are there associations among the following variables in a racially diverse community patient population: depressive symptoms, wellness, patient involvement, cultural competency, and treatment nonadherence?
- To what the extent do the exploratory variables and background characteristics predict treatment nonadherence, both separately and jointly?

Method

Participants and Procedure

The present cross-sectional pilot study recruited participants from a university medical center in a southern geographical region of the United States. We recruited community-based patients who visited the medical center for a range of acute and chronic medical conditions and mental health issues. Patients were invited to participate if they were over 18 years of age, could read English, and were willing to complete the survey while waiting for their appointment. Thus the study excluded individuals who were 18 years or younger, who could not read English, or who did not want to complete the survey after being informed of the study aims. All patients were approached while waiting for an appointment at a university's medical center. Potential participants were asked by a trained research team member to complete a 20- to 25-min paper-and-pencil survey about their physical and psychological health, cultural factors, and their relationship and experiences with their providers. Each participant who orally agreed to take part in the study received a packet that included an informed consent form, a demographic information sheet, and several questionnaires measuring the study variables. The study was approved by the institutional review board for research with human subjects.

Measures

Demographic Information Sheet

This sheet, created for the present study, asked for information regarding gender, current age, sexual orientation, level of education, and marital (or partnered) status. Participants were also asked to report both their race and their ethnicity.

Depressive Symptoms

The Center for Epidemiologic Studies Depression (CES-D) Scale (Radloff 1977) was developed to assess current levels of depression symptomatology in the general population. The CES-D consists of 20 items that correspond to signs and symptoms of major depression. Participants are asked to indicate how many days out of the previous week they have experienced a feeling or symptom related to depression. Sample items include "I felt lonely," "I felt people disliked me," and "I had trouble keeping my mind on what I was doing." Each item is scored on a 4-point Likert-type scale ranging from 0 (*rarely or none of the time*) to 3 (*most or all of the time*). Scores range from 0 to 60, with higher scores reflecting greater levels of depression symptoms. Internal consistency is considered sound at 0.85 (see Radloff 1977). Internal reliability in the present study's sample was 0.78.

Psychological Wellness or Well-being

The Satisfaction with Life Scale (SWLS; Diener et al. 1985) is a five-item scale designed to measure global life satisfaction. Sample items include "The conditions of my life are excellent," "I am satisfied with my life," and "So far I have gotten the important things I want in life." Items are scored on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Scores range from 5 to 35, with higher scores reflecting greater global satisfaction with life. Scores from the validation study suggested acceptable reliability (Cronbach's alpha = 0.87) and test–retest reliability (Cronbach's alpha = 0.82). Internal reliability in the present study's sample was 0.90.

Patient Involvement

The Patient Self-Advocacy Scale (PSAS; Brashers et al. 1999) assessed the extent to which patient-participants were involved in their health care and treatment decisions. The PSAS is a 12-item survey that measures three dimensions of patient involvement and self-advocacy: increased illness and treatment education, increased assertiveness in health care interactions, and potential for mindful nonadherence. Sample items include "I actively seek out information on my illnesses," "I frequently make suggestions to my physician about my healthcare needs," and "If my physician prescribes something I don't agree with, I question it." Each item is scored on a five-point Likert-type scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Scores range from 12 to 60, with higher scores reflecting patients' greater involvement in their health care. The validation study produced acceptable reliability of the overall scale score in each sample (Cronbach's alpha = 0.78; see Brashers et al. 1999). Internal reliability in the present study's sample was 0.83.

Patient Perception of Provider Cultural Competence

The Perceived Cultural Competency (PCC) scale (Lucas et al. 2008) is a nine-item patient report measure of cultural competency comprising three domains: cultural knowledge, cultural awareness, and cultural skills. Cultural knowledge is measured by questions such as "How well do you think your doctor understands your culture's specific characteristics?" Cultural awareness is measured by questions such as "Do you feel as though your doctor is aware of the views that he or she may have towards specific cultural groups?" Cultural skill is measured by questions such as "Does your doctor possess the skills that are needed to treat a patient from your cultural or ethnic background?" Each question is scored on a seven-point Likert-type scale for a total score ranging from 9 to 63. Higher scores reflect greater

perceptions of providers' cultural competence. Internal reliability values in a recent study ranged from 0.83 to 0.93 (Michalopoulou et al. 2009). Internal reliability in the present study's sample was 0.93.

Treatment Adherence and Nonadherence

We used the Adherence Starts with Knowledge-20 (ASK-20) Adherence Barrier Survey (Hahn et al. 2008) to measure the extent to which participants were adhering to treatment recommendations. The ASK-20, which consists of 20 items, was developed to measure barriers to adherence across disorders. Sample items include "I have to take too many medicines a day," "I just forget to take my medicines some of the time," and "I understand my doctor's/nurse's instructions about the medicines I take." Items are scored on a seven-point Likert-type scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Total scores range from 20 to 100, with higher scores reflecting higher levels of nonadherence to treatment. Matza et al. (2008) findings suggested that ASK-20 scores have acceptable reliability (Cronbach's alpha = 0.76). Internal reliability in the present study's sample was 0.70.

Analysis Strategy

All analyses were performed using SPSS version 24.0. First, we examined descriptive data (means and standard deviations) for all study variables (see Table 1). Next, we used scatter plots and Pearson product–moment correlation coefficients to determine the strength of the relations among the study variables. Finally, we conducted a multiple linear regression analysis to examine the extent to which the exploratory study factors predict treatment nonadherence separately and jointly. In the regression analysis, treatment adherence was the dependent/outcome variable, whereas depressive symptoms, well-being, involvement in

Table 1 Descriptive statistics for variables used in the study

Variables	Range	Mean	SD	Alpha
Depression	0–60	16.97	6.75	0.78
Well-being	5–35	22.16	7.92	0.90
Involvement in treatment	22–80	28.23	7.27	0.84
Provider cultural competency	9–63	49.74	9.33	0.93
Treatment nonadherence	20–100	41.30	6.78	0.70

Predictor variables: depression—Center for Epidemiologic Studies Depression (CES-D) scale; well-being—Satisfaction with Life (WELL) scale; involvement in treatment—Patient Self-Advocacy Scale (PSAS); provider cultural competency—Perceived Cultural Competency (PCC) scale. Criterion variable: treatment nonadherence—Adherence Starts with Knowledge-20 (ASK-20) Adherence Barrier Survey

treatment, and provider cultural competency were the independent/predictor variables. Marital status and education level were included as potential confounders: specifically, marital status was coded as 0 (*unmarried*) or 1 (*married or living with a partner*), and education level was coded as 0 (*high school or lower*) or 1 (*college or higher*).

Results

Participants were 88 primarily Black and White American community patients visiting a large university medical center in the southern region of the United States. The sample was 72% female ($n = 63$) and 28% male ($n = 25$). Participants identified as Black American (43.2%, $n = 38$), White American (43.2%, $n = 38$), biracial (4.5%, $n = 4$), American Indian (1.1%, $n = 1$), and Hispanic or Latino (8.0%, $n = 7$). Most participants were either married (35.2%, $n = 31$) or single (26.1%, $n = 23$), but some participants identified as being part of an unmarried couple (18.2%, $n = 16$), being divorced (11.4%, $n = 10$), being separated (5.7%, $n = 5$), or being widowed (3.4%, $n = 3$). The majority of the participants identified as heterosexual (89.8%, $n = 79$); some identified as gay or lesbian (6.8%, $n = 6$) and bisexual (1.1%, $n = 1$). Two participants did not identify their sexual orientation.

Bivariate Relations Among Study Variables

We first explored bivariate relations between the outcome and main predictor variables. Table 2 displays the intercorrelations among the study variables. Only two of the predictor variables—depressive symptoms and the patient's perception of a provider's cultural competence—and one potential confounder—marital status—were statistically significantly associated with treatment nonadherence. Contrary to what we expected, depressive symptoms scores were inversely associated with nonadherence to treatment

Table 3 Regression analysis summary for predictor variables and treatment nonadherence

Predictor Variables	B	SE B	β
Well-being	0.169	0.098	0.195
Depression	−0.330	0.112	−0.327**
Perceived cultural competency	−0.231	0.087	−0.295*
Patient involvement	0.041	0.118	0.042
Married or living as married couple (ref: unmarried)	−4.537	1.590	−0.323**
College or higher (ref: high school)	−0.198	1.672	−0.014

$R^2 = 0.29$ ($n = 88$, $p < 0.001$)

*$p < 0.05$; **$p < 0.01$

($r = -0.269$), meaning that higher levels of depressive symptoms are related to lower levels of nonadherence. However, as expected, perceived provider cultural competence was inversely associated with nonadherence to treatment ($r = -0.328$); higher levels of perceived provider competence are related to lower levels of nonadherence. Marital status was inversely associated with treatment nonadherence ($r = -0.217$); being married is related to lower levels of nonadherence. As Table 2 illustrates, the strength of the significant correlations among the study variables ranged from $r = -0.328–0.227$.

Relating Patient Factors to Treatment Nonadherence

We also conducted a multiple regression analysis to determine the extent to which the predictor variables explain treatment nonadherence separately and jointly, taking into account marital status and education level as potential confounders. Because of the exploratory nature of the study, all variables were entered simultaneously. Table 3 presents the findings from the regression analysis. The overall model established the existence of a significant relation between each of the four predictor variables and the criterion

Table 2 Intercorrelations for study variables

Variables	1	2	3	4	5	6	7
Treatment nonadherence	–						
Well-being	0.085	–					
Depression	−0.269*	−0.07	–				
Perceived cultural competency	−0.328**	0.186	0.136	–			
Patient involvement	0.03	−0.308**	0.145	-0.01	–		
Marital status	−0.217*	0.187	−0.273*	0.04	−0.259*	–	
Education level	−0.137	0.227*	0.048	0.220*	−0.320**	0.171	–

Predictor variables: depression—Center for Epidemiologic Studies Depression (CES-D) scale; well-being—Satisfaction with Life (WELL) scale; involvement in treatment—Patient Self-Advocacy Scale (PSAS); provider cultural competency—Perceived Cultural Competency (PCC) scale. Criterion variable: treatment nonadherence—Adherence Starts with Knowledge-20 (ASK-20) Adherence Barrier Survey

*$p < .05$; **$p < .001$

variable, $F = 4.445$, $p < 0.001$, $r^2 = 0.291$. The R value ($r = 0.539$) for this model meets the criterion for a medium effect size, as defined by Cohen (1992; Cohen and Cohen 1983). The R^2 value reveals that the model explains 29% of the variance observed in the criterion variable of treatment nonadherence.

Examination of the t tests on each beta weight (see Table 3) showed that depression scores (CES-D) made a significant unique contribution above and beyond the other variables: $\beta = -0.327$, $p < 0.01$. Valence of the beta weight suggested that a higher level of depression symptoms is associated with lower levels of treatment nonadherence. In addition, patient perception of a provider's cultural competence made a significant unique contribution beyond the other variables: $\beta = -0.295$, $p < 0.05$. Valence of the beta weight suggested that a higher level of a patient's perception of a provider's cultural competence is associated with lower levels of treatment nonadherence. Among the potential confounders, marital status was the only variable significantly associated with treatment nonadherence. Compared to those who are unmarried, participants who are married or living with a partner ($\beta = -0.323$, $p < 0.01$) are less likely to adhere to treatment.

Discussion

The present pilot study explored correlates and predictors of treatment nonadherence in racially diverse community patients seen at a university medical center. We tested an exploratory model undergirded by select factors—depressive symptoms, wellness, patient involvement, cultural competency, and treatment nonadherence—whose importance has been identified but not yet examined jointly in the literature. The study used a self-selected, convenience sample of community patients from a southern region of the United States. We discuss first the results of our bivariate analyses, followed by the results of our predictive model.

Bivariate analyses revealed that two of the four study variables—depressive symptoms and the patient's perception of a provider's cultural competence—are statistically significantly associated with treatment nonadherence. Contrary to associations in the literature, depressive symptoms are negatively related to treatment nonadherence, meaning depressive symptoms did not affect the extent to which the participants followed healthcare providers' recommendations. A possible explanation is that self-rated depressive symptoms among the study participants might not have been severe enough to affect self-reported nonadherence. The CES-D mean score for participants in the present study ($M = 16.97$, $SD = 6.75$) just met the cutoff score (i.e., ≥ 16) for clinically significant levels of depressive symptoms in the general population

(Radloff 1977). Thus, a majority of participants might not have had severe enough symptoms of depression to affect daily functioning, including their adherence to treatment.

Further, multiple regression analysis showed that after adjusting for other predictor variables (well-being, involvement in treatment, and provider cultural competency) and possible confounders (marital status and education level), depressive symptoms were significantly and negatively associated with treatment nonadherence. This finding contradicts previous studies that have shown a significant positive association between depression and nonadherence to treatment (Arrieta et al. 2012; Dimatteo et al. 2000; Kronish et al. 2006). However, our finding is partially consistent with Mayberry et al. (2015) study comprising participants with diabetes. Mayberry and colleagues found that the relation between depressive symptoms and nonadherence is moderated by family behavior. That is, when participants reported limited or low levels of disruptive family behaviors regarding their treatment, no significant relation was found between depressive symptoms and nonadherence. In Mayberry and colleagues' study, over half of the participants self-rated depressive symptoms, as measured by the Patient Health Questionnaire-9 (Kroenke et al. 2001), as moderate to severe.

Another important finding from the present study is that a patient's perception of the provider's cultural competence is significantly and inversely associated with nonadherence to treatment ($r = -0.295$)—implying that the higher the perceived level of provider competence, the lower the level of nonadherence. The significance of the association between provider cultural competence and treatment nonadherence was maintained in the multiple regression analysis even after adjusting for the other predictor variables and potential confounders, patients' perceptions of provider cultural competence negatively and significantly predicted nonadherence. These findings are consistent with observations by Wade and Bernstein (1991), who explored the extent of differences between clients returning for treatment when they were assigned to counselors who had not received cultural sensitivity training (control group) and those clients whose counselors had received cultural sensitivity training (experimental group). Wade and Bernstein found that clients assigned to the experimental group returned for more followup sessions and reported greater satisfaction with the counseling process than did those clients assigned to the control group. Anderson and colleagues (2003) noted that "culture and ethnicity create a unique pattern of beliefs and perceptions as to what *health* or *illness* actually mean, which in turn, influences how symptoms are recognized, to what they are attributed, and how they are interpreted and affects how and when health services

are sought" (p. 69). Therefore, it is not surprising that patients who perceive their providers to be culturally competent are more likely to adhere to treatment.

Although well-being and patient involvement were not significantly associated with nonadherence, nor did they significantly predict nonadherence, the well-being variable was significantly and negatively correlated with patients' involvement with treatment ($r = -0.308$). This finding contradicted our expectation of a positive relation between well-being and involvement with treatment, namely that patients with greater well-being would be more involved with treatment. A possible explanation is that the presenting issues for treatment of our participants may have required acute care, leading to less involvement in their treatment. In a systematic review of randomized controlled trials comparing shared decision-making interventions with non-shared decision-making interventions, Joosten et al. (2008) observed that acute care, unlike chronic care, is more likely to involve minimal patient participation. Additionally, over half the participants in the present study self-identified as Black American, a population previously found to prefer taking a less active role in treatment compared to the roles taken by White American patients (Levinson et al. 2005).

Finally, marital status was significantly associated with treatment nonadherence. Compared to those who were single, married participants and those who were members of an unmarried couple were significantly less likely to adhere to treatment. This finding contradicts previous studies that have found a positive association between being married or living with a partner and adherence to treatment (DiMatteo 2004; DiMatteo and DiNicola 1982).

Limitations of the Study

First, because we used a cross-sectional, correlational research design and analyses, we cannot make inferences or provide information related to causality. Second, the study consisted of self-reported information and therefore could have introduced bias and error in the data. A third limitation was the small convenience sample of community patients. Although the sample included Black American patients, an often understudied group, a potential selection bias may exist because of the small sample size. Future research may need to increase the sample size and include racial and ethnic groups in addition to those included in in the present study. Fourth, the CES-D does not provide a measure of severity for depression, so we could not clearly delineate the extent to which depression level might affect nonadherence (Gonzalez et al. 2007). Last, our model explained only 30% of the variance in treatment nonadherence; many other factors not measured in our study must account for nonadherence in a community patient population.

Implications for Future Research

This study showed that depressive symptoms and a provider's cultural competency are significantly and negatively associated with nonadherence to treatment. Those two study variables predict nonadherence beyond the other study variables—that is, wellness and patient involvement—which are not related to treatment nonadherence. Our results add to the literature by focusing on adult community patients and psychological health and distress in a primary-care setting, both of which are understudied aspects of treatment nonadherence research. Our main findings provide preliminary information with implications for future research.

First, these results are consonant with previous literature and underscore that provider cultural competency is important for adherence in general, and for adherence by racial and ethnic minority patients in particular (Eliacin et al. 2016; Corkery et al. 1997; McElmurry et al. 2009). Treatment nonadherence has been linked to numerous factors, such as low health literacy (Kalichman et al. 1999; Nichols-English and Poirier 2000) and low patient involvement (Hibbard and Greene 2013; Wilson et al. 2010). Less frequently studied is the implication of patients' willingness and ability to follow medical recommendations when they perceive a provider to be culturally sensitive, knowledgeable, and aware (Wright et al. 2013). Given changing demography in the United States, cultural competency in the treatment process continues to require researchers' attention. Future research must explore racial, ethnic, and cultural factors related to treatment nonadherence. A second implication for research is that depressive symptoms appear to be relevant to nonadherence to treatment, although our study identified an association not commonly found in the literature base. Additional research is needed to disentangle at what level and for whom depressive symptoms are deleterious to the treatment process (Gonzalez et al. 2007).

Third, the present study was delimited to patient self-reports. Future research will benefit from multimethod and multi-informant strategies to determine a provider's level of cultural competence and to measure other relevant factors related to nonadherence to treatment. Fourth, the present study used the ASK-20 (Hahn et al. 2008) scale to assess for nonadherence. Future research might consider additional measures of nonadherence.

Finally, researchers developing prevention and intervention models for culturally tailored health care (see Koh et al. 2014; Tucker et al. 2011) should include a measure of the patient–provider relationship, family support, patient attachment style, and relevant cultural factors to examine the extent to which other factors decrease treatment nonadherence (Hooper et al. 2012). When patients perceive

providers as more culturally competent, patients are more likely to continue treatment (Koh et al. 2014). As chronic diseases and healthcare costs drastically increase due to low treatment adherence, empirical research must expand to include interventions delivered in primary-care settings, racial and cultural differences related to psychological health and distress, and the cultural competency of health providers.

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