

RESEARCH ARTICLE

Beliefs about causes of major depression: Clinical and treatment correlates among African Americans in an urban community

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Abstract

Objectives Major depression is increasingly viewed in the United States public as a medical disorder with biological and psychosocial causes. Yet little is known about how causal attributions about depression vary among low-income racial minorities. This study examined beliefs about causes of depression and their demographic, clinical and treatment correlates in a lower income African American sample.

Method Volunteers ($N = 110$) aged 24–79 years, who participated in a family study of depression, completed a 45-item questionnaire on their beliefs about the causes of depression. We used multidimensional scaling (MDS) to cluster items into causal domains and multivariate regression analyses to test associations of causal domains with demographic and clinical characteristics and treatments received.

Results Three causal domains, conceptualized as Eastern culture/supernatural (ECS), Western culture/natural/psychosocial (WCN-P), and /neurobiological (WCN-N) attributions, were derived from MDS clusters. WCN-P was most commonly endorsed (50%–91%) and ECS least endorsed as causes of depression (10–44%). This pattern held across gender, age, educational levels, and diagnostic category. WCN-N items were moderately endorsed, with some distinction between genetic causes and other biological causes. WCN-N was positively associated with medication as opposed to other forms of treatment ($B = 1.17$; $p = .049$).

Conclusion Among low-income African Americans, beliefs about causes of depression are varied but broadly consistent explanatory models that include a combination of psychosocial causes with genetic/biological contributions. For certain individuals, supernatural and natural causal attributions may coexist without dissonance. Causal attributions may be associated with types of treatment

accepted and have implications for treatment compliance and adherence.

KEYWORDS

Blacks, causal attributions, cluster analysis, depression, illness perceptions

Major depression is a complex neuropsychiatric disorder with multiple etiological contributions. Public beliefs about the causes of depression are heterogeneous and stem from many factors, including personal experiences, formal education, generational, and cultural influences (Blumner & Marcus, 2009; Fortune, Barrowclough, & Lobban, 2004). Causal attributions are thought to affect other illness-perceptions, including severity, manageability, and prognosis, which in turn might predict treatment seeking, preferences, expectations, and compliance (Fortune et al., 2004; Lebowitz, Ahn, & Nolen-Hoeksema, 2013; Petrie, Broadbent, & Kydd, 2008).

Ideas about mental disorders such as major depression have been shown to fall along two broad categories, with further distinctions within each of them (Eisenbruch, 1990; Stefanovics et al., 2016). The “traditional” dimension represents ideas that may include an array of supernatural, spiritual, religious, and moralistic elements of Eastern cultural norms. Conversely, the “nontraditional” or contemporary dimension features social, psychological, and biological factors and elements of Western cultural ideals (Murdoch, Wilson, & Frederick, 1978a,b). These two broad dimensions are reflected in many self-report instruments designed to assess causal attributions (Eisenbruch, 1990; Moss-Morris et al., 2002; Witteman, Bolks, & Hutschemaekers, 2011). As a result, empirical investigations using these measures have yielded a cumulative body of research documenting demographic, clinical, cultural, and behavioral correlates of the two broad causal domains (Angermeyer, Holzinger, Carta, & Schomerus, 2011; Bhui, Rudell, & Priebe, 2006; Blumner & Marcus, 2009; Kvaale, Gottdiener, & Haslam, 2013).

Despite wide-ranging public and professional conceptualizations of depression etiology, there has been a notable shift away from moral, characterological and “upbringing” causal attributions to neurobiological causes, including genetics (Blumner & Marcus, 2009; Lebowitz, 2014; Pescosolido et al., 2010). This shift may have occurred for various reasons. For instance, Western ideals and Eurocentric models of mental illness have become more widespread, in part due to technological advances such as Internet and cable television. Mental health researchers, advocates, and service delivery workers have attempted to de-stigmatize mental illness by framing it as a “medical disorder” rather than a weak character or bad behavior (Corrigan, 2004; Kvaale et al., 2013; Pescosolido et al., 2010). In addition, science-driven discoveries of neurobiological pathways and biomarkers and dissemination of the findings in lay communities may lead to increased acceptance of, or preference for biological explanations (Blumner & Marcus, 2009; Lebowitz, 2014).

The effect of increased biological attributions on public attitudes toward mental illness is unclear. Recent studies have suggested biological attributions may be associated with greater acceptance of medication versus other forms of treatment. However, these attributions also increase social distancing from sufferers and their relatives and pessimism about the long-term prognosis of the illness (Angermeyer et al., 2011; Lebowitz et al., 2013; Phelan, Yang, & Cruz-Rojas, 2006).

Some research has examined the effects of race and culture on attitudes and beliefs about causes and perceptions of mental illness. Mentally ill racial minorities in the United States, including African Americans, are overrepresented in institutions such as prisons and emergency or mandatory treatment facilities and underrepresented in voluntary treatment settings (Agency for Healthcare Research and Quality, 2012; Williams et al., 2007). Their reluctance to seek treatment or their poorer adherence to conventional treatments such as psychotherapy or medication stem largely from financial and racial barriers, but they also may be influenced by their beliefs about mental illness causes (Gary, 2005; Givens, Houston, Van Voorhees, Ford, & Cooper, 2007; Schnitker, Freese, & Powell, 2000).

African Americans may harbor similar stigmatizing attitudes toward mental illness as Whites, but their racial minority status renders them doubly vulnerable to much of the systematic prejudice, negative stereotypes, and discrimination directed at the mentally ill (Alvidrez, Snowden, & Kaiser, 2008; Gary, 2005). Historically, mental illness labels such as schizophrenia and paranoia have been inappropriately applied to African Americans who attempted to resist oppressive circumstances (Metzl, 2009). Conversely, mentally ill African Americans are less likely than their White counterparts to be diagnosed with mood or anxiety disorders, and they receive harsher legal punishments for drug and other criminal offenses (Thompson, 2010). These discriminatory experiences likely shape African American perceptions about the causes of common mental illnesses, contrasting with their White counterparts. For instance, a previous study found that African Americans were less likely than Whites to endorse genetic causes or “bad family upbringing” causes of depression (Schnittker et al., 2000). In addition, cross-cultural research on causal attributions in illness has suggested that minority groups, including Blacks, may be more likely than Whites to endorse supernatural causes, particularly when presented with those causes as possible options (Landrine & Klonoff, 1994).

Further research also showed that African Americans were more likely than Whites to prefer counseling or prayer over antidepressant treatment (Givens et al., 2007). Although some of these preferences might be attributed to access and socioeconomic status (SES) differences between African Americans and Whites, other research has demonstrated that African Americans held specific doubts about the effectiveness and efficacy of antidepressant medication that were unrelated to SES (Schnittker, 2003) or concerns about negative side effects (Cooper et al., 2003).

While much of this research focuses on Black–White differences, few studies have examined variation among African Americans, who may hold a variety of differing attitudes based on education, age, and other factors. In particular, residents from low-income urban neighborhoods, who also tend to suffer higher rates of depression and other mental illnesses compared to their more affluent counterparts (Hudson, 2005), are usually underrepresented in household and nationally representative surveys of public opinions about mental illness (Jackson, Neighbors, Nesse, Trierweiler, & Torres, 2004). In addition, studies that involve racial minorities usually focus on comparing them with the White majority and interpreting and framing the findings along that dichotomy (Givens et al., 2007; Schnittker et al., 2000). This approach tends to minimize otherwise important attitudinal variations that may occur within African American communities and thus underscores the need for such empirical inquiry.

Drawing on responses from volunteers residing in urban, low-income neighborhoods, this study was designed to investigate (a) their beliefs depression causes, (b) demographic and clinical correlates of those causal attributions, and (c) associations between causal attributions and treatment received. Based on previous research, we hypothesize that psychosocial causes will be the most commonly endorsed items. We further hypothesize that neurobiological causes will be more commonly endorsed among those who are younger and have had more years of formal education, while supernatural causes will be more commonly endorsed among those who are older and less educated. In addition, we expect that neurobiological attributions will be positively associated with receiving medication.

1 | METHOD

1.1 | Recruitment and screening

Volunteers were solicited to participate in a case-control family study of major depression. They were recruited through flyers placed in waiting areas of outpatient psychiatric and family health clinics in regions that included Central Harlem, Washington Heights, and South Bronx in New York City. In addition, individuals who had participated in the study recruited some volunteers by word-of-mouth. Before being enrolled into the study, all participants were screened for eligibility via telephone and gave their verbal consent to the screening. The demographic eligibility criteria were 18 years of age or older and English speaking. Volunteers were not excluded from the larger study based on self-reported race, ethnicity, or gender. The clinical criteria screened for depressed cases (those with a past or current history of major depression) and controls (those without a lifetime history of depression). Both cases and controls

could meet criteria for anxiety disorders and substance use disorders but not bipolar disorders or psychotic disorders. In addition, individuals were excluded from the study if they were unable to report on the mental health history of two or more immediate family members.

1.2 | Sample and procedures

The research site was located at the New York State Psychiatric Institute. Participants who enrolled were required to participate in an onsite structured clinical interview (Nurnberger et al., 1994), to ascertain their psychiatric diagnostic status for the family study at the New York State Psychiatric Institute. Trained and experienced doctoral-level clinicians, who gave provisional lifetime psychiatric diagnoses according to *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition* diagnostic criteria (American Psychiatric Association, 1994), conducted this interview face-to-face. Based on the structured interview, 65 individuals received a primary diagnosis of major depressive disorder (MDD); 26 were classified as nondepressed “controls,” and 19 were classified as non-MDD “mixed,” a heterogeneous category comprising individuals who met criteria for other psychiatric illnesses that would preclude a diagnosis of MDD (e.g., bipolar disorder or psychotic disorder).

The Institutional Review Board (IRB) of the New York State Psychiatric Institute approved the study. All enrolled participants gave written informed consent for the clinical interview and an optional questionnaire. The questionnaire was a 45-item pencil-and-paper instrument designed to assess causal attributions for mental illness. The consent procedures were in accordance with IRB-approved policies and stipulated that participants could withdraw from the study at any time without loss of benefits to which they were otherwise entitled. Participants were compensated with a cash incentive of \$75 for completing the clinical interview. Completion of the questionnaire was optional and did not affect their compensation either way.

1.3 | Participants

Of the 134 participants who completed clinical interviews onsite, 120 self-reported as non-Hispanic Black or African American. Our data were based on racial and ethnic categories defined by the National Institutes of Health (NIH) Policy for Inclusion¹. For the purposes of this study, we focused on those individuals, and excluded the 14 individuals who identified as Hispanic ethnicity or race other than Black or African American. Of the 120 self-reported African American participants, 110 opted to complete the Mental Distress Explanatory Model Questionnaire (MDEMQ; Isenbruch, 1990), resulting in a 92% completion rate. The individuals who did not complete the questionnaire did not differ significantly from those who completed it by age - $t = 0.521, p = .603$, education - $t = 0.244, p = .808$, gender - $\chi^2 = 0.684, p = .408$, or clinical diagnosis - $\chi^2 = 0.092, p = .995$.

The analyzed sample comprises 51 males, 59 females and ranged in age from 24 to 79 years (mean [M] = 52.3, standard deviation [SD] = 9.51), with a median of 12 years of formal education ($M = 12.24, SD = 2.02$). More than 80% of the participants reported that they had received one or more forms of government assistance such as subsidized housing, Supplementary Security Income, and food stamps in the last 5 years. More than 90% lived in neighborhoods with poverty levels significantly higher than the national average of 13.5% (United States Census Bureau, 2016). According to community survey data from 2010–2014 inclusive and based on the participants' residential zip codes, the median poverty level for this sample was 31% and the median income ratio was 57% of the average New York State income (Economic Innovation Group, 2016).

1.4 | Research measure

The MDEMQ (Isenbruch, 1990) is a 45-item instrument that requires respondents to rate the extent to which they disagree or agree that the item causes mental distress. The responses were all scored on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with 3 being neutral. Mean scores for an item could range from a minimum of 1 to a maximum of 5.

MDEMQ items were conceptually and empirically derived from cross-cultural research and theories of illness (Murdoch et al., 1978a,b). They were initially developed to test perceptions about mental distress causes using an ethnically mixed student population in Australia that included native-born and immigrants. Examples of such items were Dangerous, unprovoked spirit, Bad luck or chance, General life stress or trauma (e.g., grief), and Genetic or inherited defect. As expected, the items were found to broadly cluster into two main domains of natural and supernatural causes and further clusters within these two broad domains (Eisenbruch, 1990).

The MDEMQ has been documented as a tool for eliciting patients' explanatory models of illness across a range of cultural contexts in clinical and research settings (Dinos, Ascoli, Owiti, & Bhui, 2017). To our knowledge, this instrument has not been used with African American samples. However, we sought a quantitative measure that would allow for exploration of the range of causal beliefs across the natural and supernatural spectrum, as well as its relative ease of use and administration.

For this study's purposes, participants were verbally instructed to consider each causal item in relation to *depression*, and to indicate, based on their own ideas, knowledge, and experiences, the extent to which they agreed or disagreed. This task was completed in an average of about 10 minutes. The instrument yielded excellent internal consistency in this sample; the Cronbach's alpha reliability for the 45 items was .97.

1.5 | Statistical analyses

1.5.1 | Multidimensional scaling (MDS)

We used multidimensional scaling (MDS) to construct causal belief domains based on the 45 questionnaire items. MDS is a data visualization technique that clusters variables of interest as a function of the underlying latent constructs that they measure (Hout, Papesh, & Goldinger, 2013). These relationships can be represented as Euclidean distances to be displayed as a perceptual map or MDS cluster plot (see Figure 1). With respect to causes of major depression, items on the questionnaire that are judged by respondents to be similar on this construct will be spatially closer to each other, and conversely items judged to be dissimilar will remain separate from each other. MDS is similar to factor analysis but uses distance measures instead of correlations/covariance between any two data points. MDS also is suited to exploratory analyses because no assumptions of data normality, independence of responses, or variance homogeneity are necessary (Hout et al., 2013).

We specified up to three dimensions using the ALSCAL algorithm (Young, Takane, & Lewyckyj, 1978) to make our results comparable to the original sample in which the MDEMQ was normed (Eisenbruch, 1990). Goodness-of-fit for MDS is denoted by two estimates. The S-Stress measure is used to gauge how well the observed data are consistent with hypothesized distances among variables (Kruskal, 1964; MacCallum, 1981). S-Stress values range from 0 (worst fit) to 1 (perfect fit). Values less than .10 are ideal, and less than .20 are acceptable (MacCallum, 1981). The R-squared correlation (RSQ) is the proportion of the variance accounted for by the squared correlation between scaled distances on the plot and actual distances in the data. RSQ estimates range from 0 to 1, with scores closer to 1 preferable. The data reduction goals and interpretability of the clusters must be balanced with the minimization of S-stress and maximization of RSQ (Hout et al., 2013).

1.5.2 | Demographic and clinical group differences based on causal domain scores

For each causal belief domain derived from the MDS analysis, we computed a domain score as the mean of responses to the items within that domain. Demographic and clinical group differences in domain scores were tested with one-way analysis of variance (ANOVA). To facilitate analysis and interpretability, we dichotomized the age variable into 0 = younger than age 50 years ($n = 32$), and 1 = age 50 years or older ($n = 78$). We also dichotomized the education (number of years completed) variable into 0 = up to high school/GED ($n = 72$), and 1 = some college or higher ($n = 38$). Repeated-measures ANOVA was used to test within-diagnostic group mean score differences across causal domains. Bonferroni adjustments were used for pairwise comparisons.

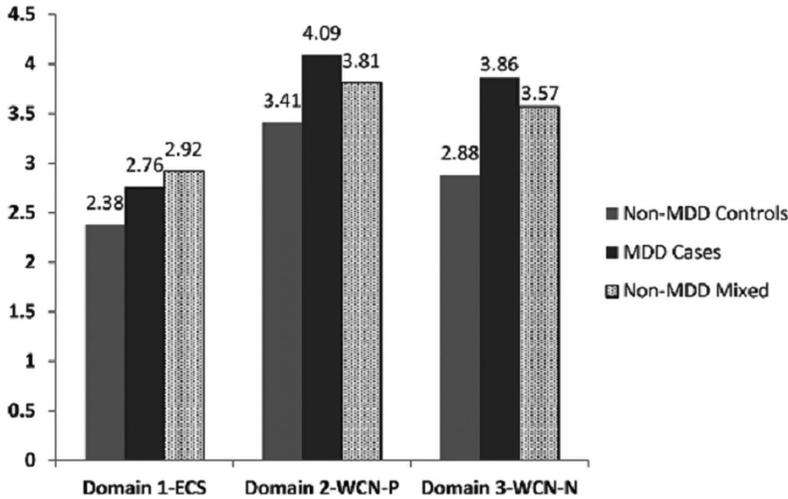


FIGURE 1 Mean scores on causal belief domains according to diagnostic category

Note. N (non-MDD controls) = 26; n (MDD-Cases) = 63; n (non-MDD Mixed) = 19.

Between-diagnostic group differences obtained via one-way analysis of variance (ANOVA), two-tailed significance; MDD-cases higher than non-MDD controls on mean scores for WCN-P and WCN-N causal domains ($p < .0001$). Within diagnostic-group differences obtained via repeated measures ANOVA, two-tailed significance; ECS mean score lower than WCN-P and WCN-N mean scores in all diagnostic categories ($p < .001$). Domain 1 = Eastern culture/supernatural (ECS); Domain 2 = Western culture/natural/psychosocial (WCN-P); Domain 3 = Western culture/natural/neurobiological (WCN-N).

1.5.3 | Relationships between causal domain scores and treatment received

As part of the structured clinical interview, participants were asked whether, at any time in their lives, they had ever received treatment for depression (or any emotional problem), whether this was voluntary or mandatory (e.g., court- or institution-mandated), and for those who had voluntary treatment, the forms of treatment received (e.g., medication, psychotherapy, self-help, hospitalization). We used multivariate logistic regression, with the three causal belief domains as predictors and the treatment variables as the outcomes. The treatment variables were as follows: (a) *any treatment* and among those who reported receiving any treatment; (b) *voluntary treatment* and among those who received voluntary treatment; (c) *medication*; and (d) *psychotherapy/counseling*.

The “Enter” method was used in four separate models, with each model including belief domains as the predictors, and one of the four treatment variables as the dependent variable. The dependent treatment variables were dichotomously coded (1 = received the treatment indicated or 0 = did not receive the treatment indicated [reference category]). Where appropriate, we controlled for gender and clinical diagnosis because they correlated with one or more treatment outcome variables (see Appendix III in the supporting information tab).

2 | RESULTS

2.1 | Causal attributions

Of the 45 items on the questionnaire, 21 were endorsed by more than 50% of the sample as being a cause of depression (Table 1). The top five items, based on proportion of the sample endorsing them, were “death of a loved one” (91%), “conflict with family or friends” (87%), “physical illness” (86%), “break up family or a failed relationship” (86%), and “general life stress or trauma” (84%). The bottom five items (shown in Appendix I in the supporting information tab for this article) were “someone wanting to hurt a person by casting a spell” (25%), “failure to properly observe rituals after

TABLE 1 Top items endorsed as causes of depression

MDEMQ Item (Listed in Order of % Agreement)	(% Agree)	Mean Item Score (SD)
Q42 - Death of relation or close friend	91	4.43 (.90)***
Q7 - Conflict with family or friends	87	3.99 (.94)***
Q8 - Physical illness	86	4.20 (.98)***
Q26 - Break up of family or a failed relationship	86	4.06 (1.09)***
Q37 - General life stress or trauma (e.g., grief)	84	4.15 (1.03)***
Q1 - Bad experiences in childhood	83	4.13 (1.16)***
Q29 - Not having enough money	83	4.06 (1.07)***
Q24 - Unemployment	78	3.92 (1.16)***
Q39 - Having had an accident	72	3.74 (1.34)***
Q2 - Exposure to a fright or shock	69	3.70 (1.22)***
Q23 - Brain damage or head injury	69	3.68 (1.45)***
Q30 - Chemical imbalance in the brain	69	3.68 (1.40)***
Q35 - Being harmed intentionally by another person	68	3.57 (1.39)***
Q33 - Bad nerves in the body	65	3.53 (1.34)***
Q10 - Genetic or inherited defect	60	3.48 (1.36)***
Q14 - Effects of old age	59	3.32 (1.36)*
Q43 - Infection	59	3.36 (1.48)*
Q3 - Doing the wrong thing during pregnancy	55	3.32 (1.43)*
Q38 - Too much work or study	55	3.29 (1.37)*
Q41 - Being born this way - i.e., inheriting bad/weak//low/cold blood	53	3.08 (1.40)
Q17 - vital organ disrupted e.g., liver/blood/bone	51	3.11 (1.51)

Note. MDEMQ = Mental Distress Explanatory Model Questionnaire; SD = standard deviation.

For mean item score, items scored on Likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. One-sample t-test (test value = 3), 2-tailed significance. * $p \leq .05$. *** $p \leq .001$. For % agreement, item response scores were collapsed into three categories: disagree (scores 1 and 2), neutral (score 3), and agree (scores 4 and 5). Complete list of 45 MDEMQ items (in order of endorsement) is provided in Appendix I in the supporting information tab for this article.

giving birth" (24%), "astrological destiny" (22%), "doing the wrong thing when menstruating" (18%), and "movement, wind/drafts/gas/milk/air flowing through a person's body" (10%).

2.2 | MDS solutions

The final solutions for two- and three-dimensions each required four iterations. The three-dimensional solution had an S-Stress of .112 and an RSQ of .933; the two-dimensional solution had an S-Stress of .143 and an RSQ of .912. These estimates for both solutions denote acceptable goodness-of-fit (Kruskal, 1964; MacCallum, 1981) and a fairly good representation of the scaled distance configurations to the actual data. Our estimates were comparable to the S-stress estimate of .135 obtained for a three-dimensional solution from the sample in which the MDEMQ was developed (Eisenbruch, 1990). (For details on MDEMQ items in each quadrant and their scores for the two-dimensional solution, see Appendix II in the supporting information tab for this article.)

Figure 2 displays the MDS plot for the two-dimensional solution with the items clustered among the four quadrants. Quadrant 1 contained 14 items, with an example being "Spirit who was angry because someone did something wrong." In quadrant 2, 12 items were clustered, with an example being "Someone wanting to hurt a person, engaging a witch/shaman to cast a spell." In quadrant 3, 11 items were clustered, with an example being "Conflict

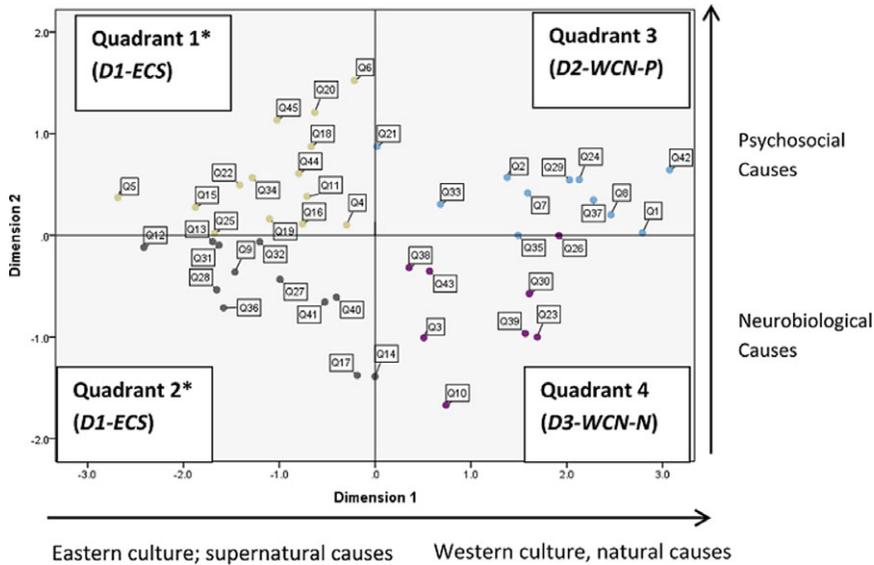


FIGURE 2 MDS plot of MDEMQ causal items

Note. For MDEMQ items in each quadrant and their scores on dimensions 1 and 2, see Appendix II.

*Quadrants 1 and 2 form a single domain (ECS).

with family or friends.” In quadrant 4, 8 items were clustered, with an example being “Chemical imbalances in the brain.”

2.3 | Causal domains

Quadrant items were conceptualized into causal domains, and mean item scores were computed to form the domain scores, which could range from 1 (low) to 5 (high). Because quadrants 1 and 2 seemed to conceptually overlap on many items, and had computed mean scores that were statistically equivalent, we combined these two quadrants to form Domain 1 for further analyses. Items in quadrants 3 and 4 were combined to form the second and third domains, respectively.

The resulting three causal domains were conceptually defined as follows: Domain 1–Eastern culture/supernatural (ECS); Domain 2–Western culture/natural/psychosocial (WCN-P); and Domain 3–Western culture/natural/neurobiological (WCN-N). The internal consistencies as measured by Cronbach's alpha were .96, .83 and .93 for the ECS, WCN-P, and WCN-N domains, respectively, indicating good to excellent reliabilities.

2.4 | Domain scores according to demographic characteristics and clinical diagnoses

Means and standard deviation in the three causal domains according to demographic group are shown in Table 2. In every age, gender, or education category, the domain score patterns were consistent with that of the overall sample (i.e., highest scores on WCN-P and lowest scores on ECS). Domain scores did not differ significantly by gender (male vs. female) or education category (HS/GED or less vs. some college or higher). For each domain, the younger than age 50 category scored significantly higher than the age 50+ category, but these score differences were more significant for the WCN-P and WCN-N domains.

Within each diagnostic group, domain scores on ECS were significantly lower than those on WCN-P and WCN-N ($p \leq .001$), consistent with the domain scores in the overall sample (Figure 1). No significant differences were found between the diagnostic groups for scores on ECS. The MDD cases had significantly higher scores than non-MDD controls on WCN-P ($p < .0001$) and WCN-N ($p < .0001$).

TABLE 2 MDEMQ causal domain scores according to demographic characteristics

MDEMQ Causal Domains	Gender		Age		Education	
	Male M (SD)	Female M (SD)	Younger than age 50 M (SD)	Age 50+ M (SD)	Up to HS/GED M (SD)	Some College or Higher M (SD)
D1-ECS	2.85 (0.86)	2.58 (0.85)	3.01 (0.79)	2.58 (0.87)*	2.68 (0.91)	2.75 (0.77)
D2-WCN-P	3.88 (0.73)	3.89 (0.72)	4.15 (0.40)	3.77 (0.80)***	3.89 (0.76)	3.87 (0.67)
D3-WCN-N	3.66 (1.06)	3.51 (1.00)	4.03 (0.74)	3.40 (1.07)***	3.52 (1.14)	3.69 (0.77)

Note. MDEMQ = Mental Distress Explanatory Model Questionnaire; SD = standard deviation; M = mean; ECS = Eastern culture/supernatural; WCN-P = Western culture/natural-psychosocial; WCN-N = Western culture/natural-neurobiological. Significant age group differences obtained via independent samples *t*-test, two-tailed significance.

* $p \leq .05$. *** $p \leq .001$.

2.5 | Forms of treatment received

Of the participants, 93 (85%) reported having received any treatment for emotional problems or psychiatric illness. Of those who reported receiving treatment, 42 (53%) reported having received both mandated and voluntary treatment, 25 received voluntary treatment only, 21 received mandated treatment only, and five individuals were unsure.

Outside of self-help groups (e.g., Alcoholics Anonymous) endorsed by 61% of the treatment sample, medication and psychotherapy/counseling were the most commonly reported forms of professional treatment, with 59% of those reporting treatment endorsing either form. Twenty-two individuals (24%) reported ever being hospitalized overnight or longer for mental illness. Among those who received mandated treatment only ($N = 21$), self-help groups were the most commonly reported form of treatment (90%), followed by medication (25%) and psychotherapy/counseling (20%). Among those who received voluntary treatment only ($N = 25$), psychotherapy/counseling was the most common form of treatment (88%), followed by medication (75%). Self-help groups were reported by 33% and hospitalization was reported by 21%.

2.6 | Relationship between causal belief domains and treatment received

Table 3 shows the unstandardized regression coefficients (B) (and p -values) for scores on each of the causal belief domains and the dependent treatment variables. Among those who received voluntary treatment, scores on WCN-N were significantly associated with receiving medication ($B = 1.17$, $p = .049$) and negatively (though not significantly) associated with receiving psychotherapy. Scores on ECS were found to be negatively (though not significantly) associated with having received both psychotherapy and medication; scores on WCN-P were found to be negatively (though not significantly) associated with having received medication and positively (though not significantly) associated with having received psychotherapy.

3 | DISCUSSION

This study was designed to explore beliefs about causes of depression using a volunteer sample of African Americans from low-income communities. Such individuals are typically underrepresented in research using nationally representative household surveys or other community surveys on issues related to beliefs mental illness and treatment. The MDEMQ measure demonstrated good fit and excellent internal consistency in the study sample and yielded comparable conceptualizations of causal beliefs, relative to the original research population on which it was normed. This study has demonstrated the applicability and utility of MDS as both a data reduction tool and a visualization tool in the investigation of mental health-related behaviors in an African American community.

Beliefs about causes of depression among low-income African Americans appear consistent with those of the general public (Blumner & Marcus, 2009; Pescosolido et al., 2010). Psychosocial causal factors received the highest

TABLE 3 Relationships between beliefs about causes of depression and treatment received

MDEMQ Causal Domains	Any Treatment ^a	Voluntary Treatment ^b	Medication ^c	Psychotherapy or Counseling ^d
	B (p)	B (p)	B (p)	B (p)
D1-ECS	0.73 (.210)	-0.43 (.427)	-0.95 (.123)	-1.22 (.082)
D2-WCN-P	0.03 (.997)	0.55 (.414)	-0.61 (.404)	2.02 (.073)
D3-WCN-N	-1.11 (.059)	0.06 (.914)	1.17 (.049)	-0.95 (.243)

Note. Regression coefficients (B) and *p*-values based on multivariate logistic regressions, two-tailed significance; ECS = Eastern culture/supernatural; WCN-P = Western culture/natural-psychosocial; WCN-N = Western culture/natural-neurobiological.

^aControlling for clinical diagnoses; reference category = did not receive any treatment.

^bAmong those who received treatment, controlling for gender and clinical diagnoses; reference category = did not receive voluntary treatment (mandatory treatment only).

^cAmong those who received voluntary treatment, controlling for clinical diagnoses; reference category = did not receive medication.

^dAmong those who received voluntary treatment, controlling for gender and clinical diagnoses; reference category = did not receive psychotherapy/counseling.

endorsement in this sample, followed by biological factors including genetics, while spiritual and supernatural causes as well as causes denoting violation of cultural rules, observations, and norms received the lowest endorsement. This general pattern was evident across gender, age educational status, and clinical diagnosis.

Our findings also reveal fairly positive endorsement of neurobiological causes of depression. Some of this effect may be attributed to the sample of volunteers, many of whom have had familiarity with formal mental illness treatment. However, this result may reflect an increased emphasis in the medical community and the society at large on biological causes of depression. Findings from the 2006 General Social Survey revealed a significant increase in public endorsement of neurobiological causes of major depression, from 54% in 1996 to 67% in 2006 (Pescosolido et al., 2010). Ideas that were once thought to be indicative of higher educational or social status have now been “mainstreamed” and observed among individuals from a variety of educational, socioeconomic, and sociocultural backgrounds. Mood disorders as medical afflictions are being increasingly portrayed in popular culture, television, and entertainment industry-media in which individuals from diverse racial and ethnic backgrounds are featured (Duca, 2015; White, 2015).

Within the cluster of biological causes, there was a distinction between a genetic cause and other biological causes. As shown in Figure 2, “Genetics or hereditary defect,” stood somewhat apart from the other “biological” items in the domain such as “Brain damage or head injury,” and “Chemical imbalance in the brain.” Furthermore, fewer people endorsed genetics than endorsed chemical imbalance or brain injury. This distinction between genetics and other non-genetic neurobiological factors such as chemical imbalances and brain damage has been noted in previous research on perceptions of mental illness among African American populations (Murphy & Thompson, 2009; Schnittker et al., 2000). It is likely that even among individuals from low-income communities with fewer years of formal education have had legitimate concerns about the use of genetics in medicine taking on different and negative connotations when applied to racial minorities, relative to Whites.

Although proportionally fewer respondents endorsed items depicting supernatural causes compared to those depicting natural causes, a significant minority—up to 40% of the sample—endorsed some of the former items. In addition, we did not find a negative relationship between the psychosocial and biological causal items and domain with the supernatural causal items (data not shown but are available upon request). This may run contrary to expectation but in fact it is quite consistent with research, showing that the two belief systems can be held simultaneously by an individual (Legare, Evans, Rosengren, & Harris, 2012; Stefanovics et al., 2016).

We did not find significant differences in belief domain scores based on gender or years of formal education, which was unexpected. This may have been a sample-specific issue that remains to be clarified with further studies. We did find some variation based on age and clinical diagnosis. Although the younger (younger than age 50) group had higher scores than the older group on all three domains, the differences were greater for psychosocial causes and biological causes than they were for supernatural causes. The difference was driven primarily by the younger group's stronger

endorsement of psychosocial and biological causes, suggesting generational differences as well as situational factors such as unemployment and interpersonal conflicts being possibly more prevalent in the younger age group. Individuals who were diagnosed with lifetime depression, relative to nondepressed controls, had higher belief scores on the psychosocial domain but not on the supernatural or biological domains. This may have been related to situational factors like current and past stressors that were salient for individuals with depression.

Among participants who had received voluntary treatment, the patterns of association between causal attributions and types of treatment received were consistent with our expectations. First, the Eastern culture/supernatural domain showed nonsignificant negative associations with both medication and psychotherapy. These inverse relationships are aligned with studies on non-Western populations whose endorsement of traditional causes of mental illness is associated with preference for faith healers and alternate treatments like fasting or stricter adherence to cultural and religious customs (Kishore, Gupta, Jiloha, & Bantman, 2011; Razali, Khan, & Hasanah, 1996). Biological causal attributions were significantly and positively associated with having received medication.

Various studies have shown that a belief in biological causes produces an expectation of more organic mental illness that requires biologically based interventions, such as medication (Lebowitz et al., 2013; Phelan et al., 2006). This expectation has been found not only in the general public but also among individuals who report depressive symptoms. At the same time, biological causal attributions do not necessarily predict a more positive view of the illness, nor do they confer immunity to stigmatized views about depression, and in some cases may be associated with lowered expectations for a positive treatment prognosis (Angermeyer et al., 2011; Kvaale et al., 2013; Lebowitz, 2014).

3.1 | Limitations

Our findings and associated conclusions must be evaluated in light of the following study limitations. First, this study focused on a sample of African Americans from lower income, urban communities, many of whom had been exposed to mental health services at some point in their lives. We acknowledge that African Americans comprise a heterogeneous population featuring individuals from a wide range of socioeconomic backgrounds, countries of origin, religions, sexual orientations, and other factors that influence their experiences of mental illness, treatment decisions, access, and preferences. This highlights the need for additional research on causal attributions among other African American subgroups as well as other minority populations who may be at increased risk of mental health stigma.

Second, the small sample size may have not yielded enough power to detect statistically significant relationships between the causal domain endorsement and treatment types. As noted, many of the findings showed nonsignificant trends. However, these associations were in the expected direction and remain to be further empirically tested with larger samples. The sample sizes also affected the clinical group categorization, where the diagnostic groups outside of "MDD-cases" had individuals with different diagnoses lumped together as "non-MDD controls" or "mixed cases." This may have diluted some of the effects that we otherwise may have found between the groups.

Third, treatment received was retrospectively self-reported and therefore subject to recall bias and other distortions based on mood and motivational factors. However, because this study examined broad trends and associations, and did not rely on specific details such as medication dose or duration of treatment, we have no reason to infer that our results were significantly distorted by recall bias.

3.2 | Directions future research

Our study suggests that African Americans from urban, low-income communities make causal attributions about major depression that are consistent with those of the wider public, and that there are variations in those beliefs based on factors like age and experiences of depression. These attributions may play a role in acceptance of certain types of treatment, which has implications for adherence and compliance and can be of utility in clinical practice. However, even when they endorse causes that may fall outside the biopsychosocial spectrum, these beliefs may coexist with their beliefs in "natural" causes. Research is needed to determine whether and how this seeming duality of natural and supernatural causal attributions might facilitate or impede progress in treatment.

Causal attributions may play a role in acceptance of certain types of treatment, which has implications for adherence and compliance, and can be of utility in clinical practice. Further studies are also needed to clarify how causal beliefs influence the decision to seek treatment and how they may interact with known barriers such as access, stigma, and mistrust. Our findings additionally stress the need for research on how these attributions are mediated through attitudes and behaviors in the cultural contexts of African Americans from different backgrounds as well as other marginalized groups.

3.3 | Conclusion

This study shows that African Americans from urban, low income communities primarily endorse psychosocial and biological causes of major depression, consistent with those of the wider public. These attributions vary based on factors such as age and individual experiences of depression, and may be associated with receiving standard treatments for depression. Some individuals may retain their beliefs in supernatural or traditional causes, even as they endorse biopsychological causes. Further studies in this population and other minority groups can clarify how causal attributions about mental disorders interact with stigma and access to influence treatment choice, adherence and compliance in clinical settings.

NOTE

¹ NIH, Office of Budget and Management – Directive 15 (1997).

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