Quality of depression treatment in Black Americans with major depression and comorbid medical illness

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Abstract

Objective—To evaluate how comorbid type 2 diabetes (T2DM) and hypertension (HT) influence depression treatment and to assess whether these effects operate differently in a nationally-representative community-based sample of Black Americans.

Methods—Data came from the National Survey of American Life (N=3,673), and analysis is limited to respondents who met lifetime criteria for major depression (MD) (N=402). Depression care was defined according to American Psychiatric Association (APA) guidelines and included psychotherapy, pharmacotherapy, and satisfaction with services. Logistic regression was used to examine the effects of T2DM and HT on quality of depression care.

Results—Only 19.2% of Black Americans with MD alone, 7.8% with comorbid T2DM, and 22.3% with comorbid HT reported APA guideline-concordant psychotherapy or antidepressant treatment. Compared to respondents with MD alone, respondents with MD + T2DM/HT were no more or less likely to receive depression care. Respondents with MD + HT + T2DM were more likely to report any guideline-concordant care (OR=3.32 95% CI [1.07, 10.31]).

Conclusions—Although individuals with MD and comorbid T2DM + HT were more likely to receive depression care, guideline-concordant depression care is low among Black Americans, including those with comorbid medical conditions.

Black Americans with Major Depressive Disorder (MD) report more chronic and severe symptoms [1] and are less likely to receive adequate mental health care than non-Hispanic whites [1-3]. Medical comorbidities including type 2 diabetes mellitus (T2DM) and hypertension (HT) can influence depression care [4, 5]. Due to their increased risk for T2DM [6] and HT [7], the effects of these medical comorbidities on depression treatment are particularly relevant for Black Americans. Understanding how depression treatment for

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Black Americans is influenced by comorbid T2DM or HT can contribute to effective mental health care for minority populations, possibly decreasing mental health care disparities.

Evidence suggests that Blacks are under-diagnosed with and under-treated for depression [2, 3, 8-15]. Much of this disparity may stem from lower treatment initiation rates [16] due to physicians' tendency to underdetect symptoms [17] and minimize Black patients' emotional symptoms [18]. Blacks often receive older, less tolerable, and less safe antidepressants [17, 19, 20]. Blacks also endorse attitudes [21, 22] and concerns about stigma that impede treatment, and are potentially less accepting of pharmacological treatment [17, 19, 23, 24]. Lastly, Blacks with depression often present with somatic symptoms [25, 26] and have comorbid medical illnesses [27] that complicate diagnosis and treatment. Given that Blacks tend to seek mental health services in primary care rather than in specialized mental health settings [28], understanding the effects of comorbid medical conditions is critical to improving mental health treatment for Blacks.

Medical comorbidities are hypothesized to influence depression care through two competing pathways [4, 5]. The *exposure effect* [4, 29, 30] posits that individuals with medical comorbidities will receive better depression care due to more frequent contact with their physicians [31]. In contrast, the *crowd-out effect* postulates de-prioritization of and poorer depression care due to competing demands of comorbid medical conditions that monopolize physicians' and patients' time and attention [32-37]. However, some studies report comparable depression treatment rates regardless of the presence of medical comorbidities [27, 29, 38-40]. These inconsistencies may be due to differences in study population and the specific medical comorbidities examined.

Fewer studies have examined the specific effects of T2DM and HT on depression care; these conditions are especially prevalent among Black Americans and are often comorbid with depression [41-43]. Findings are mixed, with some reporting better treatment [4, 44-47], while others have reported worse treatment [14], or null effects [5]. The handful of studies that have investigated these relationships among Blacks report that Blacks with comorbid depression and T2DM are less likely to be diagnosed with [48, 49] and treated for depression [49-52]. One plausible explanation is that Blacks with comorbid T2DM and depression are unlikely to discuss their depression with their physicians, partly as a result medical mistrust, stigma, and cultural beliefs around responding to depression with stoicism [52]. In fact, Blacks with comorbid depression and T2DM who perceive discrimination in healthcare are less likely to seek depression treatment, even though they may experience more symptoms [48]. Depression has also been shown to be associated with poorer medication adherence among Blacks with comorbid HT and depression [53, 54]. However to our knowledge, no studies have examined the effects of comorbid HT or comorbid HT and T2DM on depression treatment among Blacks.

Furthermore, extant studies have used small [50] or convenience samples [48, 49]. Studies have also used screening tools like the Center for Epidemiological Studies Depression Scales (CESD) [48, 49] rather than more comprehensive structured diagnostic assessments of depressive disorder. This may limit the validity of the studies, as the CESD was not intended as a diagnostic tool [55].

The primary aim of the study is: To evaluate the two competing hypotheses – the exposure and crowd-out effects – regarding how comorbid medical illness influences depression treatment in a nationally-representative sample of Blacks. The secondary aim is to assess whether these effects differ for comorbid T2DM versus HT. If we find that individuals with both depression and a medical comorbidity (i.e., T2DM, HT) report more guideline-concordant depression care than those without a medical comorbidity this will support the exposure effect hypothesis. On the other hand, if we find that individuals with both depression and a medical comorbidity report less depression treatment than those without a medical comorbidity this will support the crowd-out hypothesis.

Method

Data source

Data came from the National Survey of American Life (NSAL), a cross-sectional, nationally-representative study of mental health among Black Americans conducted from 2001-2003. Interviews were completed in the home, and interviewers were race-matched to participants [56]. Participants were community-dwelling African Americans (n=3,570), Blacks of Caribbean descent (n=1,623), and non-Hispanic Whites (n=1,006) living in census tracts with at least 10% Black Americans, recruited through multi-stage probability sampling. Overall response rate was 72.3%. Additional information about the NSAL design is available elsewhere [56]. Current analyses were limited to African Americans and Carribbean Blacks aged 30 years or older at the time of interview, who met DSM-IV criteria for MD, and had complete data on depression treatment history (n=402).

Measures

Major depression—MD status was assessed with the World Mental Health Composite International Diagnostic Interview (WMH-CIDI), a structured instrument used to assess DSM-IV diagnoses [57]. Previous research indicates moderate to substantial agreement between CIDI and blind clinical diagnoses (κ =0.53-0.71) [58], and moderate concordance between CIDI and Structured Clinical Interview for DSM-IV (SCID) diagnoses of MD among African Americans (κ =0.43), but lower concordance for Caribbean Blacks (κ =0.10), in the NSAL [1].

Depression severity—Depression severity was indexed by number of episodes and impairment [57, 59, 60]. Number of episodes was a continuous variable, measured by reported number of depressive episodes in the past 12 months. Impairment was measured by the Sheehan Disability Scale, which asks respondents to rate on a 0-10 scale, how much their depression interfered with functioning in home management, ability to work, relationships with others, and social life. [57, 59, 60]

Type 2 diabetes mellitus and Hypertension—Diabetes status was assessed by self-report of physician diagnosis of "diabetes or 'sugar,'" and did not differentiate between type 1 and type 2 diabetes. Type 1 diabetes typically onsets in adolescence, and thus to ensure that the majority of cases are T2DM we restricted the sample to those aged 30 and older. Ninety to 95% of diabetes cases in adulthood are T2DM [6]. Hypertension status was also

assessed by self-report of physician diagnosis. Self-reported hypertension and diabetes have high concordance with medical record diagnoses [61, 62].

Demographic characteristics and healthcare utilization—Demographic variables were age, sex, ethnicity (African American or Caribbean Black), insurance status (uninsured, insured but no mental health coverage, or insured with mental health coverage), household income (categorized into tertiles), and education (high school or >high school). General healthcare utilization was defined as having a usual source of care (dichotomized as yes vs. no).

Depression care—Three indicators of depression treatment quality were examined: (a) any guideline-concordant treatment, (b) guideline-concordant psychotherapy, and (c) 60 days antidepressant use. Quality of psychotherapy and antidepressant use were evaluated according to APA Practice Guideline for Treatment of Patients with MD [63]. Past year guideline-concordant psychotherapy is 4 visits to a provider each lasting an average of 30 minutes, and for antidepressants, 60 days use under guidance of a psychiatrist or other prescribing physician for 4 visits. Due to sparse data in some cells, we modified the criterion for antidepressant use to be at least 60 days' use. This standard for evaluating quality of depression care was used in a recent large scale study [2]. Any guideline-concordant care was indexed as having received either guideline-concordant psychotherapy or antidepressant use.

Data Analysis

To address our study aims, we examined individuals with MD, with and without comorbid T2DM, and with and without comorbid HT. We also examined individuals with major depression with and without comorbid T2DM and HT separately to determine the effects of the medical complexity of this group. First, we examined bivariate associations between comorbidity status (MD + T2DM vs. MD only, MD + HT vs. MD only, and MD + T2DM + HT vs. MD only), and the covariates and dependent variables using *t*-tests for continuous variables and chi-squared tests for categorical variables. Percentage, mean, standard deviation, significance tests, and logistic regression values were weighted to reflect the U.S. population using sample weight variables in the Complex Samples module of SPSS.

For multivariable analyses, we used logistic regression to compare the likelihood of the three depression care outcomes among participants with MD alone with participants with comorbid T2DM and/or HT. Models were adjusted for age, sex, ethnicity, education and insurance status. We did not adjust for household income due to its correlation with education. We assessed the relative fit of our models by comparing log-likelihood values.

Analyses were conducted using SPSS version 19. All *p*-values refer to two-tailed tests. The NSAL is approved by the Institutional Review Board at the University of Michigan. This analysis was determined to be exempt by the Institutional Review Board at Virginia Commonwealth University.

Results

The study sample was primarily female (65.1%) and African American (94.6%), with a mean age of 45.6 years (Table 1). Most of the sample had health insurance (81.4%) as well as a usual source of care (89.5%). More than one-third of the sample (38.1%) reported household incomes in the highest tertile, while 44.8% had earned degrees beyond high school. Individuals with MD reported having on average, 2.5 depressive episodes in the past year, with a mean level of impairment of 11.3 (0-40 scale). Among those with MD (n=402) 19% reported some form of guideline-concordant treatment, 11% guideline-concordant psychotherapy, and 14.3% antidepressant use for at least 60 days.

Of those with MD, 17 (3.6%) had comorbid T2DM, 126 (35.1%) had comorbid HT, and 37 (8.8%) had comorbid T2DM and HT (Table 2). Compared to individuals with MD only, individuals with comorbid MD + T2DM were more likely to be female (89.3% vs. 57.5%, p=0.013). Compared to individuals with MD only, individuals with comorbid MD + HT were older (48.4 vs. 42.6 years, p<0.001), and reported more depressive episodes (4.1 vs. 1.7, p=0.040). Similarly compared to individuals with MD only, individuals with comorbid MD + T2DM + HT were older (52.8 vs 42.6 years, p<0.001), were more likely to report the lowest tertile of household income (62.2% vs. 25.8%, p=0.002), and were more likely to have a usual source of care (98.6% vs. 88.7%, p=0.010). However, comparaed to those with only MD, comorbid T2DM and/or HT status was not associated with any significant differences in the type of depression care received in univariate analyses (Table 2).

Compared to those with only MD, neither comorbid T2DM nor comorbid HT status was associated with any significant differences in the type of depression care received in multivariate analyses (Table 3). Although the odds ratios for T2DM appeared to trend toward the crowd-out effect and the odds ratios for HT seemed to trend toward the exposure effect, they were not statistically significant (Table 3). Thus T2DM and HT had similar null effects. When sociodemographic factors were controlled, comorbid T2DM + HT was associated with greater odds of any guideline-concordant care (OR=3.32, 95% CI [1.07, 10.31]) compared to those with only MD, consistent with the exposure hypothesis (Table 3). As a post-hoc analysis we assessed whether the relationship between medical comorbidity and depression care varied by depressive severity. Depression severity (number of episodes) was significantly associated with HT comorbidity, but not with T2DM. As a result additionally adjusting for severity reduced the association between HT comorbidity and only guideline-concordant antidepressant use, but had no impact on the association between T2DM comorbidity and any of the quality of depression care indicators (data not shown).

Discussion

This study examined two competing hypotheses as to how medical comorbidity may influence quality of depression care in a large, nationally-representative sample of Black Americans. With the exception of a few notable associations between sociodemographic variables and medical comorbidity, we found that neither comorbid T2DM nor HT status was associated with type of depression care. We did find that results for comorbid T2DM + HT were consistent with the exposure effect, such that individuals with comorbid MD +

T2DM + HT were more than three times more likely to report any guideline-concordant depression care than those with MD alone.

There were several noteworthy associations between sociodemographic variables and MD + T2DM and/or HT comorbidity. First, we found that individuals with both MD and HT or T2DM + HT comorbidity were significantly older than those without a medical comorbidity, with individuals with both T2DM and HT being the oldest. This finding is not surprising given past evidence that medical comorbidity increases with age [64]. We found that individuals with comorbid HT + T2DM had significantly lower income reported the lowest incomes. Again, these findings make sense in light of the relationship between lower socioeconomic status and poor health behaviors including smoking, physical inactivity, alcohol consumption, and unhealthy eating [65], all of which underlie HT and T2DM disease processes. Yet individuals with both T2DM and HT were significantly more likely to report having a usual source of care, likely because they were also the oldest group with the lowest incomes, thus making them more likely to qualifying them for government-funded health insurance coverage.

Consistent with previous findings, few Black Americans with MD received either adequate pharmacotherapy or psychotherapy [2, 13]. Of those who received APA-guideline-concordant care, most received antidepressants, not psychotherapy, which challenges previous findings that Black Americans are not very accepting of pharmacotherapy as a treatment for MD [23, 66]. One plausible explanation is that few individuals with MD received treatment from a mental health specialist (21%), instead receiving their care in medical settings where pharmacotherapy is more common than psychotherapy [41]. Furthermore, the findings may reflect the national trend of increasing use of antidepressants and corresponding decreasing use of psychotherapy for depression management [41]. Given that approximately 90% of individuals with MD reported that they had a usual source of health care and 82% had health insurance coverage, other provider- and patient related factors may have contributed to these low rates of depression care. For example, past findings show that physicians are less likely to detect [67] and discuss depression [68] with Black American patients. Additionally, Black American patients may be less likely to disclose their symptoms to physicians [52]. Also, evidence shows that individuals treated by psychiatrists or psychologists are more likely to receive adequate depression treatment relative to those treated by primary care physicians [69]. Thus, the low rate of care by mental health specialists may have contributed to the low rates of guideline-concordant care observed.

We found no evidence for a crowd-out or exposure effect for comorbid T2DM or HT on depression care, suggesting that Black Americans with comorbid T2DM or HT are no more or less likely to receive depression treatment compared to those with only MD. These results are inconsistent with previous studies, which show that Blacks with comorbid T2DM report worse depression care [49, 51]. Our study, unlike these studies, used a representative sample and depression status based on a structured instrument; it proposes that depression care among Black Americans is uninfluenced by T2DM or HT comorbidity, as has been reported else where in a non-Black sample [5]. Moreover, these results suggest that the effects of T2DM do not differ from those of HT. However, our findings regarding comorbid MD +

T2DM + HT show that comorbid T2DM *and* HT results in better depression care for this group, in the direction predicted by the exposure hypothesis. It is plausible that the greater likelihood of depression care for this group is due to additonal overall medical care as a result of the greater complexity from multiple comorbidities [70]. It is also consistent with prevous findings that mental health treatment increases with the number of medical comorbidities [71]. Taken together our findings support a nuanced exposure hypothesis—it may be the number of medical comorbidities, rather than the presense of a specific medical comorbidty per se that influences depression care among Black Americans.

Results should be interpreted in light of study limitations. First, although this study drew from a large, nationally representative sample, for some analyses the cell sizes were small, which results in imprecise effect estimates. In addition, depression care was uncommon in the sample, even among those with severe depression, which limited our ability to detect significant predictors of depression care. Second, the depression care indicators were limited to treatment received in the past year, and thus we do not have information on previous depression treatment. Also, T2DM and HT were self-reported, though these have been found to be reasonably accurate estimates of actual diagnoses [62, 72]. Finally, the NSAL was compiled 10 years ago and it is likely that there has been an increase in the level of treatment of depression, particularly antidepressant use, in primary care in general in the intervening years. Much of this increase has been attributed to more sophisticated antidepressants with fewer side effects, proliferation of managed care, and improved effectiveness and efficiency in clinical diagnoses [41].

This analysis also has several strengths. First, it is one of the more comprehensive studies to date that examined the effects of the depression-medical comorbidity relationship on multiple aspects of depression care. By comparing the relationship between depression care and two common medical comorbidities, T2DM and HT, we were able to explore the hypothesis that the relationship between medical comorbidities on depression care differs by disease type. Second, MD was assessed using a validated, structured interview rather than a simple self-report questionnaire. Finally, to our knowledge, this is the first study to explore these relationships in a national sample of African Americans and Caribbean Blacks.

Conclusions

Our findings have implications for depression care among Black Americans. First, as in previous studies, depression care remains sub-optimal among Black Americans with MD, including those with comorbid T2DM and/or HT. Given consistent evidence that comorbid T2DM or HT and MD is associated with increased mortality [73, 74], these findings suggest that Black Americans with comorbid MD + T2DM/HT are a group needing focused attention to increase access to effective depression treatment. Second, there was evidence of comorbid T2DM + HT increasing the likelihood of depression treatment for individuals with MD. Since such exposure effects may indirectly attenuate disparities in mental health care [75], and Black Americans are less likely to seek treatment in specialized mental health settings, our findings underscore the importance of effective integrated health care [10, 76], which is especially beneficial for minorities [77], for improving mental health treatment for

Black Americans. Successful integrated care models for depression and T2DM, such as the Pathways study [78], increase access to while decreasing barriers to services [42].

Acknowledgments

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Table 1

Descriptive and clinical characteristics for total sample with Major Depression (n=402)

Characteristic	
Age, *M* (*SD*)	45.6 (10.4)
Sex (Female), N (%)	294 (65.1)
Ethnicity, N (%)	
African-American	310 (94.6)
Caribbean Black	92 (5.4)
Insurance status, N (%)	
Not insured	71 (18.5)
Insured, no MH	73 (14.0)
Insured, with MH	258 (67.5)
Household income, $	
T1 (Low)	158 (34.2)
T2	123 (27.7)
T3 (High)	121 (38.1)
Education, N (%)	
High school	227 (55.2)
> High school	175 (44.8)
Depression severity, *M* (*SD*)	
Episodes	2.5 (7.4)
Impairment	11.3 (13.4)
Has usual source of care	358 (89.5)
Any guideline-concordant treatment, N (%)	72 (19.2)
Guideline-concordant psychotherapy, N (%)	41 (11.0)
Antidepressants 60 days, N (%)	52 (14.3)

Table 2

Demographics and depression treatment by Major Depression, type 2 diabetes, and hypertension comorbidity status

Characteristic	MD no T2DM/HT (n=222)	MD + T2DM only (n=17)	p^a	MD + HT only (n=126)	p^b	MD+T2D M+HT (n=37)	p^c
Age, *M* (*SD*)	42.6 (8.7)	45.3 (10.4)	0.286	48.4 (10.8)	<0.001**	52.8 (11.7)	<0.001**
Sex (Female), N (%)	150 (57.5)	14 (89.3)	0.013*	98 (70.4)	0.076	32 (79.4)	0.053
Ethnicity, N (%)							
African-American	165 (95.1)	11 (94.4)	0.830	104 (93.5)	0.552	30 (96.2)	0.690
Caribbean Black	57 (4.9)	6 (5.6)		22 (6.5)		7 (3.8)	
Insurance status, N (%)							
Not insured	43 (21.8)	2 (16.3)	0.796	22 (16.4)	0.083	4 (8.1)	0.216
Insured, no MH	39 (16.8)	4 (13.2)		23 (9.3)		7 (16.0)	
Insured, with MH	140 (61.4)	11 (70.5)		81 (74.4)		26 (75.9)	
Household income, $							
T1 (Low)	64 (25.8)	7 (33.7)	0.259	66 (39.7)	0.107	21 (62.2)	0.003*
T2	77 (29.6)	6 (47.4)		29 (25.0)		11 (18.8)	
T3 (High)	81 (44.6)	4 (19.0)		31 (35.3)		5 (19.1)	
Education, N (%)							
High school	110 (51.6)	11 (63.7)	0.462	84 (57.1)	0.452	22 (65.0)	0.237
> High school	112 (48.4)	6 (36.3)		42 (42.9)		15 (35.0)	
Depression severity, *M* (*SD*)							
Episodes	1.7 (3.5)	1.2 (1.8)	0.532	4.1 (11.5)	0.040*	1.5 (2.4)	0.714
Impairment	9.8 (12.8)	11.4 (13.9)	0.697	13.2 (13.9)	0.076	12.7 (13.9)	0.303
Has usual source of care	193 (88.7)	15 (76.4)	0.278	114 (89.8)	0.809	36 (98.6)	0.010*
Any guideline-concordant treatment, N (%)	33 (16.3)	1 (7.8)	0.433	29 (22.3)	0.292	9 (29.2)	0.154
Guideline-concordant psychotherapy, N (%)	20 (8.3)	1 (7.8)	0.956	16 (13.1)	0.268	4 (20.0)	0.119
Antidepressants 60 days, N (%)	22 (11.9)	1 (7.8)	0.667	23 (17.7)	0.262	6 (17.9)	0.470

*
$p<0.05$

**
$p<0.001$

[a] MD no T2DM/HT vs. MD+T2DM

[b] MD no T2DM/HT vs. MD+HT

[c] MD no T2DM/HT vs. MD+T2DM+HT

Table 3

Association between Major Depression, type 2 diabetes and hypertension comorbidity status and quality of depression treatment[*] [WEIGHTED]

Characteristic	MD + T2DM OR [95% CI][**]	MD + HT OR [95% CI][**]	MD + T2DM + HT OR [95% CI][**]
Any guideline-concordant treatment	0.52 [0.06, 4.65]	1.62 [0.77, 3.37]	3.32 [1.07, 10.31]
Guideline-concordant psychotherapy	0.87 [0.10, 7.91]	1.73 [0.64, 4.66]	3.12 [0.73, 13.35]
Antidepressants 60 days	0.83 [0.10, 7.15]	1.49 [0.70, 3.20]	2.94 [0.70, 12.41]

[*]
Ref=MD no T2DM/HT

[**]
Adjusts for age, sex, ethnicity, insurance status, and education