

# PREVALENCE AND CORRELATES OF MAJOR DEPRESSIVE SYMPTOMS AMONG BLACK MEN WITH PROSTATE CANCER

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**Objectives:** The objectives of our study were to determine the prevalence of major depressive symptoms and identify factors that are associated with major depressive symptoms among Black men with prostate cancer (PCa).

**Design:** This study consisted of 415 Black men aged 40-81 years that entered the North Carolina Central Cancer Registry during the years 2007-2008. The primary outcome variable was depressive symptoms (CES-D). Factors included age, income, education, insurance status, treatment received, time between diagnosis and treatment, Gleason score, medical mistrust and experience with racism/discrimination. Logistic regression models were used to assess factors associated with the odds of having major depressive symptoms.

**Results:** The prevalence of major depressive symptoms ( $\geq 16$  on CES-D) among our sample of Black men with PCa was approximately 33%. Approximately 15% of the study participants underwent radiation beam treatment. Age was significantly associated with the odds of reporting major depressive symptoms (OR = .95, CI .91-.99) among Black men. In addition, compared with all other forms of treatment, Black men who underwent radiation beam treatment had higher odds (OR = 2.38, CI 1.02- 5.51) of reporting major depressive symptoms.

**Conclusion:** Nearly one-third of Black men with PCa in this study reported major depressive symptoms. Clinicians should pay closer attention to the mental health status of Black men with PCa, especially those who are younger and those who have undergone radiation beam treatment. Cancer survivorship, particularly quality of life, may be enhanced by opportunities for assessment, evaluation and intervention

## INTRODUCTION

Prostate cancer (PCa) is one of the most common forms of cancer to afflict American men.<sup>1</sup> While 14% of men will be diagnosed with PCa during their lifetime,<sup>2</sup> Black men are disproportionately affected by this disease.<sup>1,3</sup> Black men are less likely to be screened, are more likely to experience a longer wait after diagnosis until treatment, are more likely to receive non-aggressive treatment, experience a lower quality of life, and suffer from a higher mortality rate.<sup>4-6</sup> Older Black men are at increased risk of symptoms of depression compared with older White men.<sup>7</sup> PCa is found mainly among older men and while increasing numbers of Black men are diag-

nosed at younger ages with PCa than their White counterparts,<sup>6</sup> these Black men are of advanced age and maybe vulnerable to the onset of depression.

More than 350 million people worldwide suffer from depression.<sup>8</sup> An estimated one of five Americans will develop depression at some point in their life.<sup>9</sup> Men with PCa are at elevated risk for psychological distress, such as depression due to mortality concerns coupled with physical distress from pain, fatigue, urinary function impairment and erectile dysfunction.<sup>10-12</sup> Depression is associated with an increased likelihood of receipt of non-curative treatment, as well as lower overall survival among individuals with other types of cancers.<sup>13,14</sup> Among PCa patients, de-

of depressive symptoms among these men disproportionately affected by PCa. *Ethn Dis.* 2017;27(4);429-436; doi:10.18865/ed.27.4.429

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pression is associated with significant health resource utilization, higher health care costs and higher mortality rates,<sup>15</sup> including an increased risk of suicide.<sup>16</sup> Studies aimed at understanding depression among otherwise healthy Black men have been described as few and sporadic<sup>17,18</sup> even though the chronicity, severity, and disability of major depressive disorder

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has been found to be highest among Black Americans.<sup>19</sup> A recent report on a majority White PCa patient group found aging to be associated with greater odds of depressive symptoms after controlling for select variables including stage of disease, time since diagnosis, and treatment type.<sup>20</sup> Among otherwise healthy Black men, racism/discrimination, psychosocial factors and economic status have been shown to be major factors that

contribute to depression and depressive symptoms among Black men.<sup>21</sup> Despite the high prevalence of PCa among Black men, a glaring limitation of most previous studies aimed at measuring and understanding depression among men with PCa is the failure to include a meaningful amount of Black men, if any at all.<sup>22</sup> Thus, the objectives of our study were to estimate the prevalence of major depressive symptoms among Black men with PCa and to test the association of key demographic, psychosocial, and clinical factors with major depressive symptoms among Black men.

## METHODS

### Participants

The Diagnosis and Decisions in Prostate Cancer Treatment Outcomes (DAD) Study is a cross-sectional study designed to examine factors that influence the selection of prostate cancer treatment modality, explore race differences in disease burden, and examine quality of life. We retrospectively recruited 877 men aged 40-81 years who entered the North Carolina Central Cancer Registry (NCCCR) during the years 2007-2008 using a rapid case ascertainment procedure. Of the 877 men, 415 were Black. Black men who reported undergoing orchiectomy, cryotherapy, chemotherapy, and other treatment were dropped from our analysis due to the small sample size for each group, bringing the analytic sample for our study to 368. Eligibility criteria included being aged >35 years, prostate cancer diagnosis, and self-identified as Black.

### Procedures

Recruitment began in October 2009 and ended in December 2011. On a monthly basis, NCCC staff contacted the primary research network hospitals to request reports identifying patients meeting the eligibility criteria. The NCCCR mailed 2,379 prospective study participants a pamphlet describing the study and informing them that they may be contacted in the future to participate in a study. After our study team confirmed eligibility of 2,060 patients, the NCCCR mailed the physician of record of each eligible patient a notification of intent to contact the prospective participant about enrolling in the study. Physicians were given three weeks to object to our request to contact their patient, resulting in 34 objections. If the physician did not refuse patient contact within three weeks, we mailed the eligible patient a packet containing a recruitment letter describing the study, a NCCCR brochure, and a copy of the IRB approved consent and HIPPA forms. In the letter, a phone number was provided that prospective participants could call for questions or to decline inclusion; 667 declined at this step. Interviewers contacted the prospective study participant by telephone, rescreened them for study eligibility, explained the study, answered questions, and sought their participation. If the candidate agreed to participate (877), the interviewer reviewed the consent form, obtained verbal consent and proceeded with the survey questionnaire. The survey consisted of a series of questions related to prostate cancer, the process of care and their quality of life post-

treatment. The study was approved by the Institutional Review Boards of the Johns Hopkins Bloomberg School of Public Health, US Department of Defense, and NCCCR.

### Measures

The Center for Epidemiologic Studies Depression Scale (CES-D) was used to measure our dependent variable, depressive symptoms. The CES-D consists of 20 items (eg, I felt lonely, I was bothered by things that usually don't bother me, I was happy, I thought my life had been a failure), each expressing a depressive feeling or behavior. Participants were asked to rate how often they felt or behaved in accordance with each item during the past week, from 0 (rarely or none of the time; less than one day) to 3 (most or all of the time; 5 – 7 days). A score of 16 or higher indicates major depressive symptoms and has been used as the cutoff point for possible clinical depression.<sup>23</sup> A dichotomous variable was generated with men scoring 16 and above being represented by 1 and men who scored below 16 being represented by 0. The CES-D has been found to be reliable for assessing depressive symptoms across different populations and age groups.<sup>24</sup>

Factors included demographic, psychosocial, and clinical variables. Demographic variables included: age (measured in years), marital status (married vs not married), level of education (less than high school, high school/GED, some college/associates, bachelors, masters/PhD), annual household income (treated as a continuous variable for summary statistics (due to skewness of the distribution, values from the natural log

transformation of the continuous annual household income variable were used in the multivariate analysis) and health insurance coverage (men were asked whether or not they had private health insurance, Medicare, Medicaid, CHAMPUS or CHAMPVA). Those who responded “yes” to having any of the health insurances were considered insured, and those who did not have any health insurance were considered uninsured. Our psychosocial measures were medical mistrust and discrimination. Medical mistrust was assessed using the seven-item Medical Mistrust Index (MMI).<sup>25</sup> The scale employs Likert scale (1-4) responses ranging from “strongly disagree” to “strongly agree.” Examples of items included in the mistrust scale are: “Sometimes I wonder if hospital's staffs really know what they are doing,” “Patients have sometimes been deceived or misled by hospitals” and “When dealing with hospitals, one better be cautious.” The mean across all the measures of each respondent has been established to be a reliable score of their trust in the health care system with higher mean scores reflecting greater mistrust.<sup>25</sup> Discrimination was assessed using the Racism/Discriminatory Index.<sup>26</sup> Respondents were read the following four statements regarding racism and asked to indicate their agreement with the statements using a 5-point scale (1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4-agree, 5- strongly agree): “Doctors treat African American and White people the same”; “Racial discrimination in a doctor's office is common”; “In most hospitals, African Americans and Whites receive the same kind

of care”; “African Americans can receive the care they want as equally as White people can.” Response to “Racial discrimination in a doctor's office is common” was reverse coded and the average score for each individual was calculated across the four statements.<sup>26</sup> The categorical variable “Racism/discrimination is present in the health care system” was then created using the 5-point scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree).

Clinical variables included treatment modality, Gleason score, belief that the treatment received was the best option for the disease and time between diagnosis and treatment. Treatment modality included (prostatectomy, radiation beam, radiation seeds, hormone therapy, active surveillance, other). Treatment types that were recorded as “orchiectomy, cryotherapy, chemotherapy, and other treatments” were combined into one treatment category (other) due to the small sample size for each. Gleason scores were obtained from the pathology reports and were separated into three different categories: low-grade cancer ( $\leq 6$ ); medium-grade cancer (7); and high-grade cancer (8-10). The dichotomous variable “belief that the treatment received was the best option for the disease” was assessed and generated by asking: “Do you now believe that the treatment you got was the one that was best for you?” (No=0, Yes=1). The amount of time in months that passed between diagnosis and initial treatment was calculated. Respondents were asked “In what month and year were you diagnosed with prostate cancer?” They were also asked “In

## RESULTS

**Table 1. Distribution of select characteristics of study participants, N=368**

Variable	
Age, mean ± SD	61.9 ± 7.6
Married, %	66.5
Annual household income, mean ± SD	\$49,990.6 ± \$42,597.3
Education, %	
< High school	17.3
High school/GED	33.1
Some college/associate	23.1
Bachelor's degree	16.5
Master's degree/PhD	9.7
Health insurance, % yes	90.4
Gleason Score, %	
Low-grade cancer, ≤6	49.8
Medium-grade cancer, 7	43.8
High-grade cancer, 8-10	6.2
Treatment received, %	
Prostatectomy	67.66
Radiation beam	16.3
Radiation seeds	5.9
Hormone	1.9
Watchful waiting	8.1
Belief that the treatment received was the best option for the disease, %	94.4
Time (months) between diagnosis and treatment, mean ± SD	3.8 ± 6.0
Medical mistrust, mean ± SD	2.7 ± 0.3
Racism/discrimination is present in the health care system, %	
Strongly disagree	2.6
Disagree	35.5
Neither agree nor disagree	30.6
Agree	30.0
Strongly agree	1.1
Depressive symptoms, % yes	33.1

Data are presented as mean ± standard deviation for continuous variables and as % for categorical variables.

The distribution of select characteristics for Black DAD study participants are displayed in Table 1. On average, these men were aged 61.9 ± 7.6 years. About 82% of the study participants had at least a high school education or better, 66.5 were married and majority of the men had health insurance (90.4%). After being diagnosed, 22% of these Black PCa patients experienced a wait time of nine months or longer before being treated. The majority of the men had a prostatectomy (67.66), while 16.3% underwent radiation beam therapy. Thirty-three percent of these men reported major depressive symptoms.

The independent associations of demographic, clinical and psychosocial variables to major depressive symptoms are presented in Table 2. Age and having undergone radiation beam treatment were independently associated with reporting major depressive symptoms. As age increased, the likelihood of reporting major depressive symptoms decreased. Compared with all other forms of treatment, Black men who underwent radiation beam treatment had a higher likelihood of reporting major depressive symptoms. None of the other variables were associated with reporting major depressive symptoms.

## DISCUSSION

Depression in men with PCa is associated with significant health resource utilization, higher health care costs and higher mortality rates compared with men with PCa who are

what month and year did you receive your first treatment?" Time between diagnosis and initial treatment was calculated by subtracting the time in months that lapsed between diagnosis and initial treatment for each man.

### Analysis

Means and standard deviations for continuous variables and percentages for categorical variables were calculated to summarize the distribution of variables used in this study. Because the outcome, major depressive symp-

toms, was considered to be common (>10%), modified Poisson regression with robust standard errors was used to estimate prevalence ratios and corresponding 95% CIs to estimate the independent effect of each demographic, clinical, and psychosocial variable on major depressive symptoms.<sup>27,28</sup> All variables were specified simultaneously. P <.05 were considered to be significant. All calculations and statistical procedures were performed using Stata statistical software, Version 13.1 (StataCorp LP, College Station, TX).

not depressed.<sup>29</sup> Most studies aimed at understanding depression and depressive symptoms in men with PCa failed to include a meaningful amount of Black men if any at all.<sup>22</sup> In this study, we sought to identify factors associated with reporting major depressive symptoms among a sample of Black men with PCa. One in three men in our sample of Black men with PCa reported major depressive symptoms. Younger age and undergoing radiation beam treatment were independently associated with higher likelihood of reporting major depressive symptoms. The current findings support the idea that special emphasis needs to be directed toward making sure that the mental health of Black PCa patients is assessed and cared for.

Previous estimated rates of depression among men with PCa vary widely resulting in the emergence of disagreements in the literature.<sup>22</sup> While previous estimates vary, a recent review of the literature determined that the prevalence of depression among men with PCa was approximately 18%.<sup>30</sup> However, only one other study has examined depression among Black men with PCa.<sup>31</sup> Nelson et al found that a lower percentage of Black men with PCa displayed clinically significant depressive symptoms compared with their White counterparts.<sup>31</sup> In Nelson's study, the sample consisted only of 55 Black men who were obtained after pooling samples from two separate studies; neither study had access to data on SES and thus, did not control for income. Also, as the authors noted, their sample of Black men were obtained from sites with a low concentration of Black men, who may therefore be exceptional

**Table 2. IRR and 95% CI relating demographic, clinical and psychosocial variables to major depressive symptoms among Black men in The Diagnosis and Decisions in Prostate Cancer Treatment Outcomes Study**

	IRR (95% CI)
Age, years	.97 (.94- .99) <sup>a</sup>
Married	1.01 (.63-1.46)
Annual household income	.83 (.66- 1.03)
Education <sup>b</sup>	
High school/GED	1.08 (.58- 2.01)
Some college/associate	1.20 (.62- 2.30)
Bachelors	1.24 (.57- 2.69)
Masters/PhD	1.02 (.42- 2.44)
Health insurance	1.48 (.94- 2.33)
Gleason Score <sup>c</sup>	
Medium-grade cancer, 7	.94 (.64- 1.39)
High-grade cancer, 8-10	.85 (.41- 1.74)
Treatment received <sup>d</sup>	
Radiation beam	1.76 (1.12- 2.76) <sup>a</sup>
Radiation seeds	1.38 (.58- 3.25)
Hormone therapy	.95 (.31- 2.89)
Active surveillance	1.01 (.46- 2.20)
Treatment received was the best option	.64 (.40- 1.03)
Medical mistrust	1.20 (.68- 2.12)
Racism/discrimination is present in the health care system <sup>e</sup>	
Strongly disagree	1.49 (.61- 3.67)
Disagree	1.29 (.84- 1.97)
Agree	.87 (.52- 1.47)
Strongly agree	
Time between diagnosis and treatment <sup>f</sup>	1.11 (.88- 1.39)

a. P<.05.

Reference categories: b. < high school; c. Low-grade Cancer (≤6); d. Prostatectomy; e. Neither agree nor disagree; f. < 3 months.

IRR, incidence rate ratio; GED, general educational development (high school equivalent).

and not representative of men from community health centers with a different demographic.<sup>31</sup> The prevalence of major depressive symptoms among our sample of Black men with PCa is 33%. Given the sparsity of reports on depression among Black men with PCa, further studies are warranted.

In our study, as age increased, the likelihood of reporting major depressive symptoms decreased among Black men with PCa. Contrary to our finding, a previous report found aging to be associated with greater depressive symptom.<sup>20</sup> However, this was among a sample of mostly White,

older men (88%) who were aged 68 years on average.<sup>20</sup> In addition, that report utilized the depression subscale of the Hospital Anxiety and Depression Scale while our report utilized the CES-D, which might also factor into the differing findings. A number of reports have shown that older cancer patients report lower levels of psychological distress<sup>32,33</sup> which lends support to our current findings.

Treatment for PCa usually involves surgery or radiation. In cases of more widespread or metastatic disease, hormones and/or chemotherapy might be considered as options. De-

pending on age, stage of the disease, and other co-morbidities; active surveillance may be a more appropriate strategy, especially for older individuals with low-grade and early-stage tumors. Black men are less likely than Whites to believe that they received the best treatment for their cancer.<sup>34</sup> Previous reports have found a link between hormone therapy and depression<sup>35-37</sup> while at least one did not.<sup>38</sup> The current data did not reveal any links between hormone therapy and depressive symptoms among our sample of Black men. However, data from the current report shows that Black men who underwent radiation

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beam treatment had higher likelihood of reporting major depressive symptoms compared with Black men who underwent other forms of treatment. The current data are in line with a previous report that found that PCa patients who underwent radiotherapy had higher levels of depression, anxiety, and a lower quality of life.<sup>39</sup>

### Limitations

There are some limitations associated with this study. A history of clinical depression increases the odds of depressive symptoms among men with PCa.<sup>22</sup> Furthermore, preexist-

ing diagnosis of depressive disorder among men with PCa is independently associated with PCa treatment choice and PCa outcomes.<sup>40</sup> However, we do not have a measure of the prevalence of depressive symptoms among our sample before PCa diagnosis. Consequently, we do not know whether men with major depressive symptoms opted more often for radiation beam treatment or if major depressive symptoms developed more often in men who opted for radiation beam treatment. Irrespective of temporal order, radiation beam treatment is positively associated with reporting major depressive symptoms among Black men with PCa. This line of inquiry merits further investigation. It is likely that personal encounters with racial discrimination has a greater effect on psychological distress, however the racism/discrimination index used in the current study assessed perception of racism/discrimination rather than assessing personal experiences directly. Another limitation to this study is that men who received "orchiectomy, cryotherapy, chemotherapy, and other treatments" were dropped from our analysis due to the small sample size for each. Thus, we were unable to determine the likelihood of reporting major depressive symptoms for each of those individual treatment choices.

While there are some limitations, there are several strengths associated with this study. Our study is one of the first dedicated to understanding depression among Black men with PCa and provides data on a population that has been underrepresented in this area of research. We also view the broad range of demographic,

clinical and psychosocial variables in our analysis as a strength, laying the foundation that we hope will drive future research in understanding depressive symptoms among Black men with PCa. Among otherwise healthy Black men, racism/discrimination was found to be a major factor that contributes to depression and depressive symptoms.<sup>21</sup> This study is the first to incorporate the Medical Mistrust and the Discriminatory care index as possible predictors of depressive symptoms among men with PCa. Our work found no association between depressive symptoms and medical mistrust or experiences with discrimination among Black men with PCa. Additionally, our study consisted of men with varying forms of health insurance, which is representative of the general population and men with PCa that ranged from low-to-medium-to-high grade tumors.

### CONCLUSION

Results indicate that there is a high prevalence of depression among Black men with prostate cancer. Age and undergoing radiation beam treatment were found to be independently associated with depressive symptoms among these men. Further research within this area is warranted to ensure that depression in Black men with PCa does not go undiagnosed or undertreated. More work is desperately needed to further catalogue the prevalence, to identify other possible correlates, and to evaluate interventions that might reduce the presence of depressive symptoms among men with PCa.

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CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: Kinlock, Howard, LaVeist, Thorpe; Acquisition of data: Howard, LaVeist, Thorpe; Data analysis and interpretation: Kinlock, Bowie, Parker, Thorpe; Manuscript draft: Kinlock, Parker, Howard, Bowie, LaVeist, Thorpe; Statistical expertise: Kinlock, Parker, LaVeist, Thorpe; Acquisition of funding: Howard, LaVeist; Administrative: Kinlock, Parker, Howard, Bowie, LaVeist, Thorpe; Supervision: Kinlock, Parker, Howard, Bowie, LaVeist, Thorpe

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