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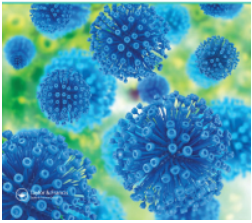
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# Higher religiosity and spirituality are associated with ethnic group membership among middle-aged and older adults living with HIV

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**Background:** HIV is a chronic illness that impacts the lives of more than 1 million people in the United States. As persons living with HIV (PWH) are living longer, it is important to understand the influence that religiosity/spirituality has among middle-aged and older PWH.

**Objective:** Compare the degree of religiosity/spirituality among middle-aged and older PWH and HIV-negative individuals, and to identify demographic, clinical, and psychosocial factors associated with religiosity/spirituality among PWH.

**Method:** Baseline data on 122 PWH and 92 HIV-negative individuals (ages 36-65 years; 61.1% Non-Hispanic White) from a longitudinal study were analyzed for the current study. Recruitment occurred through HIV treatment clinics and community organizations in San Diego. Participants completed questionnaires on religiosity, spirituality, and psychosocial functioning. Independent samples *t*-tests, Pearson correlations, and multiple linear regression analyses were conducted to test the study objective.

**Results:** No significant differences in religiosity/spirituality were found between PWH and HIV-negative individuals. Demographic and psychosocial variables were unrelated to religiously/spirituality among HIV-negative individuals. Among PWH, multiple linear regression models indicated higher daily spirituality was significantly associated with racial/ethnic minority membership (Hispanic/Latino, African American/Black, or Other), fewer years of estimated duration of HIV, greater social support, and higher grit. Greater engagement in private religious practices was significantly associated with racial/ethnic minority membership and higher social support.

**Conclusions:** For PWH, being a racial/ethnic minority and having higher social support was associated with greater engagement in religious/spiritual practices. Future longitudinal studies should examine whether religion/spirituality impacts well-being across the lifespan among racial/ethnic minority groups of PWH.

**Keywords:** Faith, social support, ethnic studies, HIV/AIDS, psychosocial functioning

## Key Points

- Middle-aged and older persons with and without HIV did not differ in their engagement in daily spirituality or private religious practices, nor were engagement in these religious/spiritual behaviors related to age.
- Unlike HIV-negative individuals, greater engagement in religious/spiritual behaviors among persons living with HIV were uniquely associated with racial/ethnic

minority membership, greater social support, and greater grit.

- Further analysis among persons living with HIV indicated greater engagement in religious/spiritual behaviors were most related to racial/ethnic minority membership and greater social support.

## Introduction

There is a wide array of religious and spiritual beliefs across the United States. Religiosity and spirituality are related to increased subjective well-being

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and happiness,<sup>1</sup> and people who consider themselves to be religious/spiritual often report enhanced physical and mental health.<sup>2</sup> Additionally, persons who actively engage in religious/spiritual practices tend to have more coping resources (e.g., social support network) than those who do not regularly engage in religious/spiritual practices.<sup>1</sup> Older adults are generally more religious and/or spiritual than younger adults,<sup>3</sup> and members of racial/ethnic minority groups in the U.S. (i.e., African Americans/Blacks and Hispanics/Latinos) report higher rates of religiosity and spirituality compared to Non-Hispanic Whites.<sup>4,5</sup>

Studies have consistently found that individuals diagnosed with chronic illnesses (e.g., hypertension, heart disease, diabetes, cancer) engage in religious/spiritual behaviors more frequently than healthy adults,<sup>6,7</sup> yet there have been mixed findings of religious/spiritual practices among persons living with HIV (PWH).<sup>8–10</sup> While many studies have found PWH participate in more religious/spiritual practices since diagnosis,<sup>11–18</sup> there are also barriers to participation for many PWH.<sup>19</sup> These barriers include stigma<sup>19,20</sup> and other unintended outcomes in this population, such as developing feelings of guilt or anxiety, denial of sexual identity, or poor adherence to use of medications.<sup>21</sup> However, involvement in religious and spiritual practices may allow PWH to overcome barriers to successful aging, such as decreased social support, mental illness, multi-morbidity, and financial concerns.<sup>20</sup> Among PWH, those who do identify as religious/spiritual show increased positive health behaviors, greater social support, greater hope, lower cortisol levels, and improved long-term survival.<sup>21–23</sup>

A gap in the literature still exists regarding differences in religious/spiritual involvement and prevalence rates between PWH and HIV-negative individuals as well as how PWH who are religious/spiritual may differ from non-religious/non-spiritual PWH in terms of demographic, clinical, and psychosocial factors. Therefore, the first aim of this study was to examine differences in religiosity/spirituality among PWH and HIV-negative individuals. It was hypothesized that PWH would have greater religiosity/spirituality than HIV-negative individuals, despite the barriers listed above. The second aim of the study was to identify factors related to religiosity/spirituality among PWH. We hypothesized that PWH who had greater religiosity/spirituality would be older, part of a racial/ethnic minority group, and have greater social support.

## Method

### Participants

One hundred and twenty-two PWH and 92 HIV-negative individuals were enrolled in the longitudinal *Multi-Dimensional Successful Aging Among HIV-Infected Adults* study at the University of California, San Diego (UCSD) HIV Neurobehavioral Research Program (HNRP). Participants were recruited from HIV treatment clinics and various community organizations in San Diego County. For the purposes of the current study, only baseline data were examined. At the baseline visit, participants completed a neuropsychological testing battery, a comprehensive neuromedical evaluation, and self-report questionnaires of spirituality, social engagement, and other positive psychosocial factors. The study was approved by the UCSD Institutional Review Board (IRB), and all participants and provided written, informed consent. Inclusion criteria included: aged 36 to 65, fluent in English, and able to provide informed consent to participate in research. Exclusion criteria were minimal in order to maximize generalizability to the population of PWH in San Diego County, and included: 1) psychotic disorder (e.g., schizophrenia), 2) neurological condition (e.g., seizure disorder, stroke), and 3) head injury with loss of consciousness greater than 30 minutes. After participants were assessed for eligibility, participants were administered comprehensive neuromedical and neurobehavioral assessments. HIV disease characteristics (e.g., viral load, estimated duration of HIV, current CD4) were collected during a neuromedical assessment and blood draw. An HIV/HCV finger stick point of care test (Abbott RealTime HIV-1 test, Abbott Laboratories, Illinois, USA) was used to test all participants for HIV-infection. Of the participants who reported they were HIV-negative at screening, none tested positive for HIV nor HCV. The neurobehavioral assessment evaluated physical and psychosocial domains of aging. Several studies at the HNRP have assessed associations between persons living with HIV and mental, physical, cognitive, and psychological factors,<sup>24–26</sup> but have not specifically examined religiosity and spirituality as the outcome variables within this group.

### Measures

#### *Religiosity and spirituality*

The Brief Multidimensional Measure of Religiosity and Spirituality (BMMRS) was used to measure the extent to which participants considered themselves to be religious/spiritual.<sup>27</sup> For the BMMRS, religiosity is operationally defined as a system of worship and

doctrine in a group setting.<sup>27</sup> Spirituality is operationally defined as being concerned with the meaning of life and the transcendent.<sup>27</sup> The full version of the BMMRS includes 13 subscales. To limit participant burden, individuals were administered the Daily Spirituality and Private Religious Practices subscales.

The 6-item Daily Spirituality subscale measures the individual's perception of the transcendent in daily life, and the perception of interaction with, or involvement of, the transcendent in life (e.g., "I feel God's presence," and "I am spiritually touched by the beauty of creation"). The items are scored on a six-point scale, from 1 = *Many Times A Day* to 6 = *Never or Almost Never* and summed, with lower scores indicating greater daily spirituality.

The 5-item Private Religious Practices subscale assesses the types and frequency of religious and spiritual practices individuals may perform in private, such as "How often do you pray privately in places other than at church or synagogue?" The first four items are scored on an eight-point scale, with 1 = *More Than Once A Day* and 8 = *Never*, and the last item, which asks about frequency of praying with meals, is scored on a five-point scale, from 1 = *At all meals* to 5 = *Never*. Item scores are summed, with lower scores indicating greater engagement in private religious practices. Both BMMRS subscales were reverse-coded, so higher scores indicate greater levels of religiosity and spirituality in our analyses.

### Psychosocial functioning

In order to examine correlates of religiosity/spirituality, we used questionnaires measuring positive psychosocial factors, depressive symptomatology, stress, and negative life events. The selected factors were chosen due to prior literature examining their associations with religiosity/spirituality,<sup>23,28–31</sup> with few studies examining each of these factors in the context of PWH. Participants completed the following measures of positive psychosocial functioning: the Duke Social Support (DSS) scale, a four-item subscale of social support;<sup>32</sup> Life Satisfaction Scale (LSS), a five-item measure of satisfaction in one's life;<sup>33</sup> Grit Scale, a 12-item measure of one's resolve;<sup>34,35</sup> and the Connor Davidson Resilience Scale (CDRS-10), a measure of one's general resilience.<sup>36</sup> For all of these scales, higher scores indicate more positive psychosocial functioning.

To assess current depressive symptomatology, participants completed the Center for Epidemiologic Studies Depression (CES-D), a 20-item measure of depressive symptomatology over the past week.<sup>37</sup> Higher scores on the CES-D indicate greater

depressive symptomatology. The 12-item WHI Life Events Scale (LES) was used to measure potential traumatic events over the past year and the impact on one's life,<sup>38</sup> and daily stress was assessed with the 10-item Perceived Stress Scale (PSS).<sup>39</sup> For the LES and PSS, higher scores indicate more distress.

### Statistical analysis

IBM SPSS Statistics for Mac, Version 25, was used for all analyses.<sup>40</sup> Independent sample *t*-tests were conducted to compare differences in BMMRS subscales between HIV status groups. Next, we conducted Pearson correlations to analyze the bivariate relations between religiosity/spirituality and demographic, clinical characteristics, and psychosocial factors separately in each group. Lastly, variables that were significantly associated with the BMMRS subscales at  $p < 0.05$  were included in multiple linear regression models to determine the most influential factors related to religious/spiritual behaviors in PWH. Race/ethnicity was evaluated in two ways: as a dichotomous variable where minorities were grouped together, and on the original scale with Non-Hispanic White used as the reference group. When race/ethnicity was evaluated using Non-Hispanic White as a reference group, a  $p < 0.01$  was applied to control for multiple comparisons.

### Results

Descriptive and clinical characteristics are presented in Table 1. PWH were primarily middle-aged, Non-Hispanic White males with some college education. Most PWH have had a long estimated duration of HIV disease and had an undetectable plasma viral load at their baseline visit. HIV-negative individuals had significantly more females and more years of education compared to PWH ( $p = .02$  and  $p < .01$  respectively).

### Group differences in religiosity and spirituality

Controlling for demographic characteristics, there were no significant differences among PWH and HIV-negative individuals across the two BMMRS subscales (Daily Spirituality:  $t = 1.30$ ,  $p = 0.19$ ; Private Religious Practices:  $t = -0.51$ ,  $p = 0.61$ ; comparisons without controlling for demographic characteristics are presented in Table 1). Among PWH and HIV-negative participants, the two BMMRS subscales were highly correlated (PWH:  $r = 0.77$ ,  $p < 0.01$ ; HIV-negative individuals:  $r = 0.88$ ,  $p < 0.01$ ).

**Table 1 Demographic and clinical statistics by HIV status**

	PWH (n = 122)	HIV-negative (n = 92)	t or $\chi^2$	df	p-value
<b>Demographics</b>					
Age M (SD)	50.7 (8.4)	50.8 (7.6)	0.09	212	0.93
Sex n, (% Male)	102 (83.6)	65 (70.7)	5.14	1	0.02
Race/Ethnicity:					
Non-Hispanic White, n (%)	66 (54.1)	65 (69.6)	6.85	3	0.08
African American/Black, n (%)	23 (18.9)	13 (14.1)	—	—	—
Hispanic/Latino, n (%)	23 (18.9)	13 (14.1)	—	—	—
Other, n (%)	10 (8.1)	2 (2.2)	—	—	—
Education yrs M (SD)	14.0 (2.4)	15.1 (2.3)	3.27	212	<0.01
<b>Clinical Characteristics</b>					
Est. Dur. Of HIV yrs Mdn (SD)	18.4 (8.7)	—	—	—	—
Nadir CD4 Mdn (IQR) <sup>a</sup>	180.0 (47-341)	—	—	—	—
Current CD4 Mdn (IQR) <sup>b</sup>	633.0 (424.5-850. 8)	—	—	—	—
Undetectable Plasma Viral Load n (%) <sup>c</sup>	109 (92.4)	—	—	—	—
AIDS status n, (% Yes)	74 (60.7)	—	—	—	—
ARV Status n, (% On) <sup>d</sup>	115 (95.8)	—	—	—	—
<b>BMMRS Subscales, M (SD)</b>					
Daily Spirituality	17.4 (9.9)	14.9 (9.1)	1.92	212	0.06
Private Religious Practices	11.7 (8.9)	11.3 (9.7)	0.30	212	0.77
<b>Psychological Factors, M (SD)</b>					
Duke Social Support	8.3 (1.9)	8.5 (1.7)	-0.58	208	0.56
Life Satisfaction Scale	19.2 (7.6)	23.8 (6.9)	-4.44	210	< 0.01
Grit Scale - Brief	3.6 (0.7)	3.9 (0.5)	-4.04	210	< 0.01
Connor Davidson Resilience Scale	29.6 (7.7)	32.7 (6.3)	-3.20	211	< 0.01
Center for Epidemiologic Studies - Depression Scale	19.3 (8.3)	14.9 (4.8)	4.52	211	< 0.01
WHI Life Events Scale	7.2 (6.5)	4.6 (3.5)	3.41	211	< 0.01
Perceived Stress Scale	15.1 (8.2)	10.4 (6.5)	4.55	211	< 0.01

Note. <sup>a</sup>n = 121; <sup>b</sup>n = 116; <sup>c</sup>n = 118; <sup>d</sup>n = 120; M = mean; SD = standard deviation; Mdn = median; IQR = interquartile range.

**Correlates of religiosity and spirituality among persons living with HIV**

Results of bivariate correlations of the BMMRS subscales in HIV Status groups, including demographic variables (age, sex, race/ethnicity, and education), HIV disease characteristics (estimated duration of disease, current and nadir CD4, viral load, AIDS status, and ARV status), and psychosocial factors (social support, life satisfaction, grit, resilience, depression, life events, and perceived stress), are presented in Table 2. Results on HIV-negative individuals were excluded from further analyses, as there were no significant relationships between daily spirituality or private religious practices with demographic variables or psychosocial factors. Among our sample of PWH, greater daily spirituality was significantly associated with racial/ethnic minority membership ( $p < .01$ ), shorter duration of HIV ( $p = .02$ ), greater social support ( $p = .01$ ), more life satisfaction ( $p = .04$ ) and more grit ( $p < .01$ ). More engagement in private religious practices was related to race/ethnicity ( $p < .01$ ), greater social support ( $p < .01$ ), more resilience ( $p < .01$ ) and more grit ( $p = .04$ ). Follow-up post hoc analyses indicated African American/Black PWH engaged in more daily spirituality and private religious practices compared to Non-Hispanic Whites, Hispanics/Latinos or Other Race/Ethnicities ( $p$ 's all  $\leq 0.01$ ).

**Table 2 Pearson correlations with BMMRS subscales among PWH**

	Daily Spirituality	Private Religious Practices
Age	-0.06, <i>n.s.</i>	-0.06, <i>n.s.</i>
Sex (Male)	0.16, <i>n.s.</i>	0.17, <i>n.s.</i>
Racial/Ethnic Minority	0.27** $p < 0.01$	0.36** $p < 0.01$
Education (years)	-0.16, <i>n.s.</i>	-0.12, <i>n.s.</i>
Est. Dur. Of HIV (years)	-0.21* $p = 0.02$	-0.13, <i>n.s.</i>
Nadir CD4	-0.02, <i>n.s.</i>	-0.09, <i>n.s.</i>
Current CD4	-0.08, <i>n.s.</i>	-0.13, <i>n.s.</i>
Undetectable Plasma Viral Load	0.02, <i>n.s.</i>	-0.03, <i>n.s.</i>
AIDS status	-0.001, <i>n.s.</i>	0.04, <i>n.s.</i>
ART Status	0.11, <i>n.s.</i>	0.1, <i>n.s.</i>
DSS-4	0.23* $p = 0.01$	0.24** $p < 0.01$
LSS	0.18* $p = 0.04$	0.13, <i>n.s.</i>
Grit Scale - Brief	0.25** $p < 0.01$	0.24** $p < 0.01$
CDRS-10	0.16, <i>n.s.</i>	0.19* $p = 0.04$
CES-D	-0.08, <i>n.s.</i>	-0.14, <i>n.s.</i>
WHI-LES	0.06, <i>n.s.</i>	0.10, <i>n.s.</i>
PSS	-0.16, <i>n.s.</i>	-0.11, <i>n.s.</i>

Note. Racial/Ethnic Minority = African American/Black, Hispanic/Latino, or Other race/ethnicity; DSS-4 = Duke Social Support Scale-4 item; LSS = Life Satisfaction Scale; CDRS-10 = Connor Davidson Resilience Scale - 10 item; CES-D = Center for Epidemiology Depression Scale; WHI-LES = World Health Organization Life Events Scale; PSS = Perceived Stress Scale; \*denotes  $p < 0.05$ ; \*\*denotes  $p < 0.01$ ; *n.s.* = not significant ( $p > 0.05$ ).

Variables that were significantly associated with BMMRS subscales (i.e., racial/ethnic minority membership, estimated duration of HIV, social support, life satisfaction, grit, and resilience) were included in multiple regression models to determine the most

**Table 3 Multivariable analyses (PWH)**

	Daily Spirituality
Overall Model Summary	Adjusted $R^2=.17$ , $F=5.91$ , $df=114$ , $p<0.01$
Racial/Ethnic Minority	$b=0.24$ , $t=2.84$ , $p<0.01$
Est. Dur. of HIV	$b=-0.20$ , $t=-2.42$ , $p=0.02$
Social Support	$b=0.21$ , $t=2.36$ , $p=0.02$
Life Satisfaction	$b<0.01$ , $t=2.84$ , $p=0.99$
Grit	$b=0.20$ , $t=2.12$ , $p=0.04$
	Private Religious Practices
Overall Model Summary	Adjusted $R^2=.21$ , $F=9.11$ , $df=114$ , $p<0.01$
Racial/Ethnic Minority	$b=0.38$ , $t=4.63$ , $p<0.01$
Social Support	$b=0.26$ , $t=2.98$ , $p<0.01$
Grit	$b=0.15$ , $t=1.48$ , $p=0.14$
Resilience	$b=-0.02$ , $t=-0.16$ , $p=0.87$

Note.  $b$  = standardized coefficient.

influential factors associated with religiosity/spirituality in PWH (see Table 3). In this model, greater daily spirituality was significantly associated with racial/ethnic minority membership ( $p<.01$ ), shorter estimated duration of HIV-infection ( $p=.02$ ), greater social support ( $p=.02$ ) and higher grit ( $p=.04$ ). Greater engagement in private religious practices were significantly associated with racial/ethnic minority membership and greater social support ( $ps<.01$ ), whereas grit and resilience were not significantly related to private religious practices in the multiple regression model.

In order to identify religious/spiritual differences among racial/ethnic minority groups, additional multiple regression models were conducted with racial/ethnic minority membership and each of the BMMRS subscales as shown in Table 4. Statistical analyses indicated that being African American/Black, compared to Non-Hispanic White, and having a shorter estimated duration of HIV disease were significantly related to greater daily spirituality ( $ps<.01$  respectively). More engagement in private religious practices was significantly related to being African American/Black or Hispanic/Latino, compared to Non-Hispanic White, and having greater social support ( $ps\leq.01$ ).

**Discussion**

Religious and spiritual beliefs and practices vary between health groups and have been linked to positive life changes in those who regularly participate in religious/spiritual activities, particularly among chronically ill individuals.<sup>6,7</sup> The purpose of the current study was to examine differences in rates of religiosity/spirituality among middle-aged and older PWH and HIV-negative individuals, and to determine factors that were significantly associated with religiosity/spirituality among PWH. Contrary to our first hypothesis, religiosity/spirituality did not significantly differ between PWH and

**Table 4 Multivariable analyses with race/ethnicity (PWH)**

	Daily Spirituality
Overall Model Summary	Adjusted $R^2=.24$ , $F=6.32$ , $df=112$ , $p<0.01$
African American/Black <sup>a</sup>	$b=0.38$ , $t=4.43$ , $p<0.01$
Hispanic/Latino <sup>a</sup>	$b=0.09$ , $t=0.98$ , $p=0.33$
Other <sup>a</sup>	$b=-0.02$ , $t=-0.18$ , $p=0.86$
Est. Dur. of HIV	$b=-0.22$ , $t=-2.64$ , $p<0.01$
Social Support	$b=0.16$ , $t=1.85$ , $p=0.07$
Life Satisfaction	$b=0.04$ , $t=0.45$ , $p=0.66$
Grit	$b=0.15$ , $t=1.62$ , $p=0.11$
	Private Religious Practices
Overall Model Summary	Adjusted $R^2=.24$ , $F=7.47$ , $df=112$ , $p<0.01$
African American/Black <sup>a</sup>	$b=0.44$ , $t=5.16$ , $p<0.01$
Hispanic/Latino <sup>a</sup>	$b=0.23$ , $t=2.79$ , $p<0.01$
Other <sup>a</sup>	$b=0.09$ , $t=1.03$ , $p=0.31$
Social Support	$b=0.22$ , $t=2.56$ , $p=0.01$
Grit	$b=0.12$ , $t=1.19$ , $p=0.24$
Resilience	$b<-0.01$ , $t=-0.01$ , $p=0.99$

Note. <sup>a</sup>The reference category is: Non-Hispanic White;  $b$  = standardized coefficient.

HIV-negative individuals. These findings are somewhat consistent with past HIV-related research, in which some studies also did not find significant difference in rates of religious and spiritual beliefs among PWH compared to HIV-negative individuals.<sup>8,24</sup>

While there were no significant relationships between daily spirituality or private religious practices with demographic variables or psychosocial factors among the HIV-negative participants, in PWH, racial/ethnic minority membership (African American/Black, Hispanic/Latino, or Other race/ethnicity) and greater social support were significantly associated with greater religiosity and spirituality. We found racial/ethnic minority membership was significantly associated with religiosity/spirituality among PWH on both subscales of the BMMRS in univariable and multivariable analyses, and that African American/Black PWH consistently reported higher religiosity/spirituality than any other racial/ethnic minority group and Non-Hispanic Whites. African American/Black, Hispanic/Latino, and Other racial/ethnic PWH reported greater religiosity/spirituality than Non-Hispanic White PWH, which has been seen in previous cross-sectional research.<sup>9,29,41</sup> Additionally, in a longitudinal study assessing spiritual coping over time among PWH, African Americans/Blacks reported significantly greater positive spiritual coping (defined as building on a loving view of God or a Higher Power and a sense of connectedness with the religious community)<sup>42</sup> than Hispanics/Latinos and Non-Hispanic Whites.<sup>23</sup> Overall, it has been consistently demonstrated that PWH in a racial/ethnic minority group report higher religiosity/spirituality, and our findings further support this body of literature.<sup>11</sup>

Similar to racial/ethnic minority membership, greater social support was significantly associated with religiosity/spirituality in PWH across two subscales of the BMMRS. Religious/spiritual PWH reported greater levels of social support than non-religious/non-spiritual PWH, which is consistent with prior HIV and chronic illness research.<sup>9,20,21,29,43</sup> In a cross-sectional study conducted by Cuevas et al.,<sup>9</sup> higher rates of religiosity/spirituality were significantly associated with social support. In a review of religiosity/spirituality among older PWH, Vance et al.<sup>20</sup> found engagement in religious/spiritual activities among PWH to be significantly associated with greater perceived social support, including greater perceived social support when compared to other chronically ill adults. Another group who examined baseline data on middle-aged and older PWH<sup>29</sup> found that higher overall spirituality and a “Sense of Meaning and Peace” were significantly associated with having greater social support. In qualitative work, investigators found that the benefits of religious and spiritual beliefs and practices include offering a sense of belonging and social support.<sup>43</sup> In this study, interviewees reported church attendance to be a great way to connect with the congregation and attendees of the church(es). In support of these perceptions, Emler and colleagues also found qualitative evidence of the importance of church and their beliefs for developing social connections with people among religious and spiritual older PWH.<sup>21</sup>

Our findings, coupled with findings from previous studies, support the importance of religiosity and spirituality among racial/ethnic minority PWH,<sup>9,11,23,41</sup> particularly as religiosity and spirituality related to greater social support.<sup>9,20,21,29,43</sup> However, to-date, few research studies have attempted to incorporate religiosity and spirituality into treatments and interventions for PWH.<sup>44,45</sup> Szaflarski<sup>44</sup> discussed the mixed findings of previous religious and spiritual interventions within clinical and community settings, most of which led to marginal improvements to religiosity and spirituality. A main concern of researchers are the perceptions held about PWH, which greatly contribute to experiences that range from HIV-related stigma to acceptance and support in congregations. Qualitative research has explored ways to incorporate religious and/or spiritual supports in HIV-related programming. Grieb et al.<sup>45</sup> found that Black sexual minority men were most supportive of having more religious/spiritual supports in non-church settings and indicated an interest in the use of peer supports. Of the participants in this study living with HIV, they reported keeping their faith to be important for maintaining their HIV-related treatment plans.<sup>45</sup> This work, coupled with

quantitative findings from this study and other studies, can inform future researchers on how to best serve PWH and address their religious and spiritual needs.

There are a number of limitations to this study. First, we were limited in our use of the BMMRS to measure religiosity and spirituality. The BMMRS may be culturally biased, as some items referenced religious themes common in Western culture (e.g., bible, church, synagogue), and may diminish the importance of other religious/spiritual practices. Furthermore, participants in this study were only administered two of thirteen subdomains of the BMMRS. While this was done in order to reduce participant burden, this ultimately limited our analyses to a narrow selection of subdomains of religiosity/spirituality. Another limitation to the study was that all participants completed their study visit in English, which may have further limited our ability to capture a more diverse experience, such as for Spanish-speaking Hispanics/Latinos. Furthermore, there was limited representation of racial/ethnic minorities in both study groups. Lastly, the current study used cross-sectional data, which prevents us from making inferences of causality.

In conclusion, these findings suggest that it is important to evaluate religious/spiritual involvement in the lives of racial/ethnic minority PWH, as taking this information into account may lead to the implementation of more culturally relevant clinical services. While scientific communities have recognized religious/spiritual involvement for its potential benefits on health outcomes among certain populations, few research studies have incorporated interventions for PWH that consider themselves to be religious/spiritual, which may be particularly relevant for older racial/ethnic minority PWH. As suggested by Szaflarski, community engagement is crucial for the development and implementation of effective interventions and programs.<sup>44</sup> Thus, future researchers should increase community engagement in order to identify population-specific concerns. By doing so, future researchers can collect data on HIV-related stigma to evaluate the impact that it may have on religious/spiritual engagement, considering the historical stigma associated with living with HIV/AIDS.

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Dr. Raeanne Moore is a co-founder of KeyWise, Inc. and a consultant for NeuroUX. None of these roles represent a conflict to this study. No other authors report any conflict of interest.

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### Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### References

- Jackson BR, Bergeman CS. How does religiosity enhance well-being? The role of perceived control. *Psycholog Relig Spiritual*. 2011;3(2):149–161.
- Johnstone B, Yoon DP, Cohen D, et al. Relationships among spirituality, religious practices, personality factors, and health for five different faith traditions. *J Relig Health*. 2012;51(4): 1017–1041.
- Bengtson VL, Silverstein M, Putney NM, Harris SC. Does religiousness increase with age? Age changes and generational differences over 35 years. *J Sci Study of Religion*. 2015;54(2): 363–379.
- Marquie MJ, Maldonado Y, Zlatar Z, et al. Differences in life satisfaction among older community-dwelling Hispanics and non-Hispanic Whites. *Aging & Mental Health*. 2015;19(11): 978–988.
- McCauley J, Tarpley MJ, Haaz S, Bartlett SJ. Daily spiritual experiences of older adults with and without arthritis and the relationship to health outcomes. *Arthritis Rheum*. 2008;59(1): 122–128.
- Caplan LS, Sawyer P, Holt C, Allman RM. Religiosity and function among community-dwelling older adult survivors of cancer. *J Relig Spiritual Aging*. 2013;25(4):311–325.
- Vance DE, McGuinness T, Musgrove K, Orel NA, Fazeli PL. Successful aging and the epidemiology of HIV. *Clin Interv Aging*. 2011;6:181–192.
- Fazeli PL, Montoya JL, McDavid CN, Moore DJ. Older HIV + and HIV – adults provide similar definitions of successful aging: A mixed-methods examination. *Gerontologist*. 2020;60(3): 385–395.
- Cuevas JE, Vance DE, Viamonte SM, Lee SK, South JL. A comparison of spirituality and religiousness in older and younger adults with and without HIV. *J Spirituality in Mental Health*. 2010;12(4):273–287.
- Doolittle BR, Justice AC, Fiellin DA. Religion, spirituality, and HIV clinical outcomes: a systematic review of the literature. *AIDS Behav*. 2018;22(6):1792–1801.
- Sutton MY, Parks CP. HIV/AIDS prevention, faith, and spirituality among Black/African American and Latino communities in the United States: Strengthening scientific faith-based efforts to shift the course of the epidemic and reduce HIV-related health disparities. *J Relig Health*. 2013;52(2):514–530.

- 12 Dalmida SG, Kraemer KR, Ungvary S, Di Valerio E, Koenig HG, Holstad MM. The psychosocial and clinical well-being of women living with Human Immunodeficiency Virus/AIDS. *Nurs Clin North Am.* 2018;53(2):203–225.
- 13 Ironson G, Stuetzle R, Fletcher MA. An increase in religiosity/spirituality occurs after HIV diagnosis and predicts slower disease progression over 4 years in people with HIV. *J Gen Intern Med.* 2006;21(S5):S62–S68.
- 14 Cotton S, Tsevat J, Szaflarski M, et al. Changes in religiosity and spirituality attributed to HIV/AIDS: Are there sex and race differences? *J Gen Intern Med.* 2006;21(S5):S14–S20.
- 15 Ironson G, Kremer H. Spiritual transformation, psychological well-being, health, and survival in people with HIV. *Int J Psychiatry Med.* 2009;39(3):263–281.
- 16 Trevino KM, Pargament KI, Cotton S, et al. Religious coping and physiological, psychological, social, and spiritual outcomes in patients with HIV/AIDS: Cross-sectional and longitudinal findings. *AIDS Behav.* 2010;14(2):379–389.
- 17 Tsevat J, Leonard AC, Szaflarski M, et al. Change in quality of life after being diagnosed with HIV: A multicenter longitudinal study. *AIDS Patient Care STDs.* 2009;23(11):931–937.
- 18 Kremer H, Ironson G, Kaplan L. The fork in the road: HIV as a potential positive turning point and the role of spirituality. *AIDS Care.* 2009;21(3):368–377.
- 19 Medved Kendrick H. Are religion and spirituality barriers or facilitators to treatment for HIV: a systematic review of the literature. *AIDS Care.* 2017;29(1):1–13.
- 20 Vance DE, Brennan M, Enah C, Smith GL, Kaur J. Religion, spirituality, and older adults with HIV: Critical personal and social resources for an aging epidemic. *Clin Interv Aging.* 2011; 6:101–109.
- 21 Emlet CA, Harris L, Pierpaoli CM, Furlotte C. The journey I have been through”: The role of religion and spirituality in aging well among HIV-positive older adults. *Res Aging.* 2018;40(3): 257–280.
- 22 Porter KE, Brennan-Ing M, Burr JA, Dugan E, Karpiak SE. Stigma and psychological well-being among older adults with HIV: The impact of spirituality and integrative health approaches. *Gerontologist.* 2017;57(2):219–228.
- 23 Kremer H, Ironson G. Longitudinal spiritual coping with trauma in people with HIV: implications for health care. *AIDS Patient Care and STDs.* 2014;28(3):144–154.
- 24 Moore RC, Moore DJ, Thompson W, Vahia IV, Grant I, Jeste DV. A case-controlled study of successful aging in older adults with HIV. *J Clin Psychiatry.* 2013;74(5):e417–e423.
- 25 Moore RC, Hussain MA, Watson CW, et al. Grit and ambition are associated with better neurocognitive and everyday functioning among adults living with HIV. *AIDS Behav.* 2018;22(10): 3214–3225.
- 26 Moore DJ, Fazeli PL, Moore RC, the HIV Neurobehavioral Research Program, et al. Positive psychological factors are linked to successful cognitive aging among older persons living with HIV/AIDS. *AIDS Behav.* 2018;22(5):1551–1561.
- 27 Fetzer I. *Multidimensional Measurement of Religiosity/Spirituality for Use in Health Research: A Report of the Fetzer Institute/National Institute on Aging Working Group.* Kalamazoo, MI: John E Fetzer Institute; 2003.
- 28 Dalmida SG, Koenig HG, Holstad MM, Wirani MM. The psychological well-being of people living with HIV/AIDS and the role of religious coping and social support. *Int J Psychiatry Med.* 2013;46(1):57–83.
- 29 Cotton S, Puchalski CM, Sherman SN, et al. Spirituality and religion in patients with HIV/AIDS. *J Gen Intern Med.* 2006; 21(S5):S5–S13.
- 30 Barton YA, Miller L. Spirituality and positive psychology go hand in hand: An investigation of multiple empirically derived profiles and related protective benefits. *J Relig Health.* 2015; 54(3):829–843.
- 31 Vitorino LM, Low G, Vianna LAC. Linking spiritual and religious coping with the quality of life of community-dwelling older adults and nursing home residents. *Gerontol Geriatr Med.* 2016;2:233372141665814.
- 32 Blazer DG, Hybels C, Hughes DC. *Duke Social Support Index: DSSI.* Princeton, NJ; Educational Testing Services: Center for the Study of Aging and Human Development, Duke University Medical Center; 1990.
- 33 Diener E, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Pers Assess.* 1985;49(1):71–75.
- 34 Duckworth AL, Peterson C, Matthews MD, Kelly DR. Grit: perseverance and passion for long-term goals. *J Pers Soc Psychol.* 2007;92(6):1087–1101.
- 35 Duckworth AL, Quinn PD. Development and validation of the Short Grit Scale (GRIT-S.). *J Pers Assess.* 2009;91(2):166–174.
- 36 Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor–Davidson resilience scale (CD-RISC): validation of a 10-item measure of resilience. *J Traum Stress.* 2007; 20(6):1019–1028.
- 37 Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Appl Psychol Measurement.* 1977;1(3):385–401.
- 38 Holmes TH, Rahe RH. The social readjustment rating scale. *J Psychosom Res.* 1967;11(2):213–218.
- 39 Cohen S. Perceived stress in a probability sample of the United States. In: Spacapan S; Oskamp S, eds. *The Social Psychology of Health.* Thousand Oaks, CA: Sage Publications; 1988:31–67.
- 40 IBM SPSS Statistics. *Version 25.0.* NY: IBM Corp; 2017.
- 41 Lorenz K, Hays RD, Shapiro MF, Cleary P, Asch SM, Wenger NS. Religiosity and spirituality among HIV-infected Americans. *J Palliat Med.* 2005;8(4):774–781.
- 42 Plante TG, Thoresen CE. *Spirit, Science, and Health: How the Spiritual Mind Fuels Physical Wellness.* Westport, CT, US: Praeger Publishers/Greenwood Publishing Group; 2007.
- 43 Siegel K, Schrimshaw EW. The perceived benefits of religious and spiritual coping among older adults living with HIV/AIDS. *J Sci Study of Religion.* 2002;41(1):91–102.
- 44 Szaflarski M. Spirituality and religion among HIV-infected individuals. *Curr HIV/AIDS Rep.* 2013;10(4):324–332.
- 45 Grieb SM, Donovan E, White JJ, Miller D, Dangerfield DT. Increasing opportunities for spiritual and religious supports to improve HIV-related outcomes for Black sexual minority men. *J Urban Health.* 2020;97(5):704–714.