Risk and Protective Factors of Posttraumatic Stress Disorder (PTSD) Among African American Women Living with HIV

Eaden Andu, MSW, MPHc

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Committee:

Deepa Rao

Brad Wagenaar

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Abstract

African American women comprise an estimated of 64% new infections among women of all races in the US. In this study, we have set out to examine the complex nexus of Posttraumatic Stress Disorder (PTSD) and HIV infection among African American women. Two hundred and thirty-nine African American women living with HIV participated in this cross-sectional study. We examined age, marital status, level of education, stigma and social support as independent variables and PTSD symptoms as the dependent variable using logistic regression. We analyzed the bi-variate associations between each variable and PTSD symptoms, and then constructed a multi-variable model which controlled for all variables simultaneously. Our findings revealed that 67% of the women reported clinically significant PTSD symptoms. Also, age, education, internalized stigma, and social support are associated with PTSD symptoms. Education, older age, and social support were protective factors against PTSD symptoms. Finally, our findings suggest that understanding of PTSD symptoms in this population may be paramount to improving prevention, care, and treatment.

Introduction

In the United States (US), an estimated 1.2 million people are currently living with HIV (PLWH) (Center for Disease Control and Prevention, 2011). Women are increasingly bearing the burden of the HIV epidemic, they account for 27% of all HIV/AIDS diagnosis (Machtinger, Wilson, Haberer, & Weiss, 2012).The CDC estimates that there are at least 40,000 new HIV infections occurring every year since 1994 (Lee & McKenna, 2007). Most disturbingly, AIDS is a leading cause of death for African American women aged 20 to 54 (CDC, 2014).

African American women comprise an estimated of 64% new infections among women of all races in the US (Ivy, Miles, Le, & Paz-Bailey, 2014). The continuous transmission of HIV among an already vulnerable segment of American society has been shown to be rooted in systematic and structural factors that are influenced by poverty, education, and historical neglect of this community (Wolde-Yohannes, 2012).

PTSD and HIV

A growing body of research shows that posttraumatic stress disorder (PTSD) is associated with higher prevalence of HIV among women in the US (Machtinger et al., 2012). For African American women, experiencing trauma may facilitate the likelihood of engaging in risky behaviors including unsafe sexual practices and risky substance use. Studies have shown that women living with PTSD are more likely to engage in high HIV risk behaviors, such as having multiple intimate partners, frequent sex trade, and reduced condom use (Morrill, Kasten, Urato, & Larson, 2001).

Exposure to traumatic events and developing PTSD predisposes women to poor health outcomes such as HIV (El-Bassel, Gilbert, Witte, Wu, & Vinocur, 2010; Machtinger et al., 2012). Ten percent of women develop PTSD in their life time, compared to 4% or men

(NCPTSD, 2017). In addition, one study has shown just over one third of African American women present with symptoms of PTSD (Brownley, Fallot, Wolfson Berley, & Himelhoch, 2015). In another study, 94% of African American women with substance use disorder reported having one trauma exposure per lifetime, and over 51% met the DSM IV criteria for PTSD diagnosis (Meshberg-Cohen, Presseau, Thacker, Hefner, & Svikis, 2016).

PTSD impacts the quality of life of those living with HIV, and leads to poor health management (Gonzalez et al., 2016), and exacerbates poor outcomes for this vulnerable population. Examining risk and protective factors for PTSD symptoms among women who live with HIV is important to help develop evidence-based intervention with high risk individuals (Martinez, Israelski, Walker, & Koopman, 2002).

Resiliency Factors

It is estimated that adults aged 50 years and over and living with HIV represent 50% of PLWH in the US (Beaulaurier, Fortuna, Lind, & Emlet, 2014). Age is strongly associated with perceived HIV-related stigma largely due to feelings of being an unvalued member of one's community (Cuca et al., 2017). A study on resilience found that even after experiencing oppression and hardship, middle aged and older African American women living with HIV demonstrate the ability to endure and adapt by sustaining any support that's available to them (Subramaniam, et al., 2016).

Ability to obtain education influences the level of information or knowledge about HIV transmission. One study found that overall level of knowledge about HIV infection was low among high risk African American individuals, and that obtaining higher education beyond high school was a protective factor (H, CE, & KW, 2016).Overall, women who have been living with HIV for longer periods cited that having support from relationships with family, friends, and

partners contributed to their resilience and ability to manage and live with this chronic disease (Emlet, Tozay, & Raveis, 2011).

Dayton and colleagues found that social support, such as the support offered by family, spouses, and peers, provided an important coping mechanism for women living with HIV (Davtyan, et al., 2016). Edwards and colleagues (2006) found that African American women's perceptions of positive support included having partners or children, and having a caring family. In other study, researchers found that women between ages 52-65 also identified needing peer social support, and having an emotionally supportive health care providers for better long term outcomes with their care (Warren-Jeanpiere, Dillaway, Hamilton, Young, & Goparaju, 2017).

Stigma and its relationship PTSD

African American women have shared their experiences on HIV stigma-related barriers such as feeling lonely, unloved, and these feelings' impact on things like medication adherence and engagement in health care (Edwards, 2006). Also, stereotypes and negative interpretations of HIV perpetuated by people in their communities can lead to a fear of intimate relationships and nondisclosure of their HIV status, leading to potential further spread of HIV (Cole, Logan, & Shannon, 2007; Lang et al., 2003). Studies have no examined the relationship between Stigma and PTSD, even though both stigma and PTSD may share common causes and consequences for adherence and engagement in care.

In this study, we have set out to examine risk and protective factors for PTSD among African American women with HIV. There is an urgent need for understanding of these factors for targeted and culturally-appropriate interventions to address the complex nexus of trauma, HIV infection risk, and positive coping skills for living with HIV. We used baseline data from a larger randomized clinical trial [Clinicaltrials.gov number NCT01893112] to explore how age,

education, marital status, social support, and stigma are associated with PTSD symptoms amongst African American women living with HIV.

Methods

This cross-sectional study was nested within a larger randomized clinical trial [Clinicaltrials.gov number NCT01893112]. We used the baseline data for this study to examine the risk and protective factors of PTSD among African American women living with HIV.

Participants

Eligible study participants were compromised of women who met the following criteria: (1) self-identified as having African American racial/ethnic background, (2) were at least 18 years of age or older, and (3) had a documented HIV positive status. Women who identified as African American but were not born in the United States were not included in the study.

Setting

We recruited participants from university and hospital-affiliated HIV clinics in Birmingham, Alabama and Chicago, Illinois. We recruited participants via signs that were posted at clinics to advertise the study and research assistants met potential participants during clinic visits. Data were gathered in office spaces within the clinics to maximize convenience for participants who were attending clinic visits.

Procedures

Research assistants described study procedures to participants to ensure clear understanding of the purpose of the study. Participants then provided written informed consent before study measures were implemented. The data for this study was collected using the Audio Computer Assisted Self Interview System (ACASI) (The NIMH Collaborative HIV/STD Prevention Trial Group, 2007), in which participants were able to wear headphones to hear and

respond to the questions through this system. This system was chosen because it ensured that participants had privacy, and helped for those with limited literacy ability in comprehension of the study questions (Pluhar et al., 2007).

Measures

We analyzed socio-demographic (age, marital status, level of education) and psychosocial information (level of stigma, Social Support, PTSD) for the present study. We analyzed age as a categorical variable from "18-35" to "56+", educational level as a categorical variable from "Less than HS" to "College degree or above", and marital status as a categorical variable from "Never Married" to "Separated or divorced". We collected and analyzed the psychosocial variables as described below.

Internalized Stigma. We examined levels of stigma using the 14-item version of the Stigma Scale for Chronic Illness. The scale has been adapted and validated for use with African Americans living with HIV (Rao et al., 2012; Rao, Molina, Lambert, & Cohn, 2016). The scale included questions such as: "because of my illness, I felt different from others" and "I felt embarrassed about my illness" with Likert-type response choices. The scale demonstrated good psychometric properties with a sample of African Americans living with HIV (Rao et al., 2016). We summed the item responses to form a total score, which had a possible range of scores from 0 to 44.

Social Support. We measured Social Support using the 19 item Medical Outcomes Study-Social Support Survey (MOS_SSS), to assess perceived social support in relation to HIV status (Robitaille, Orpana, & McIntosh, 2011). Women were asked questions about what type of support they had available with questions such as: "someone to give you good advice about a crisis" or "someone to share your most private worries and fears with" with Likert-type response

choices. We analyzed a total score calculated by summing all the item responses, and the total scores had the possibility of ranging from 0 to 70.

Posttraumatic Stress Disorder Symptoms. We assessed the participants' symptoms of PTSD using the PTSD checklist (Kessler et al., 2011). The PTSD checklist used all 17 items (with Likert-type response choices) corresponding to DSM-IV symptoms (American Psychiatric Association, 2013). Symptoms of PTSD such as: "feeling distant or cut off from other people?" or "repeated, disturbing memories, thoughts, or images of a stressful experience from the past?" were assessed. When calculating PTSD scores, we summed the items to form the total score. A cutoff of 30 or higher (out of 85) indicated a clinically-significant level of PTSD, and this cutoff was used to categorize this data into "low vs. high PTSD" symptom groups.

Statistical Analysis

We examined age, marital status, level of education, stigma and social support as independent variables and PTSD symptoms as the dependent variable using logistic regression. We first analyzed the bi-variate associations between each variable alone and PTSD symptoms. We then constructed a multi-variable model which controlled for all variables simultaneously. Analyses were conducted using Stata 14 and an alpha value for statistical significance of $\alpha=0.05$ using two-tailed tests. Significance of categorical variables was determined by likelihood-ratio tests.

Results

Background Information

Two hundred and thirty-nine women completed baseline assessments. One hundred and thirty-two women resided in Chicago, IL and 107 in Birmingham, AL. Table 1 lists means and frequencies for the socio-demographic variables for all participants, separated by clinically significant high and low PTSD levels. The mean age of the participants was 46.7 years

(SE=10.5). In terms of education, 37% had “less than High School (HS)”, 23% had “HS degree or equivalent”, 29% had “some college or technical degree”, and 8% had “college degree or above”.

In terms of marital status, 23% were married or living with partner, 41% were separated divorced or widowed, and 36% never been married. Furthermore, 67% of the women reported clinically significant PTSD symptoms (total scores of >30 out of 85). All variables used in this study had a few missing data for some participants except for age. This was likely due to missed responses or lost data in the process of coding and transmitting the information from the study site to the data collection manager.

Unadjusted Regression Models

Age was not significant in the unadjusted regression model through a likelihood ratio test. However, there was a statistical trend, and older women had lower odds of high PTSD symptoms (Odds Ration [OR]: 0.39; 95% Confidence Interval [CI]: 0.18, 0.89).

By contrast, education as a categorical variable was significantly associated with PTSD scores ($p<0.01$), with lower levels of education associated with increased odds of high PTSD symptoms. For example, the odds of high PTSD symptoms (total score of >30 on PTSD Checklist) for those with a high school education was significantly lower than those who had less than a high school education (OR: 0.41; 95% CI: 0.19, 0.89). Individuals with a college degree or above had even lower odds of high PTSD symptoms compared to those with a high school education or less (OR: 0.26; CI: 0.09, 0.75).

Marital status was not significantly associated with the odds of high PTSD ($p=0.13$). Social support was significantly associated with PTSD symptoms, showing a protective effect ($p<0.01$). For each 1-unit increase in the social support scale, the odds of high PTSD decreased

by 3% (OR: 0.97, CI: 0.94, 0.99). Internalized stigma was significantly associated with PTSD, although as a risk-factor ($p<0.001$). For each 1-unit increase in the internalized sigma scale, the odds of high PTSD increased by 30% (OR: 1.3; CI: 1.2, 1.4).

Adjusted Regression Model

In the adjusted model, age was not a significant predictor of PTSD. Levels of education were a significant protective factor against high PTSD symptoms ($p<0.01$), with odds of high PTSD decreased with increasing levels of education. For example, for those having completed some college or a college degree or above having lesser odds of high PTSD compared to those with less than a HS education. Marital status as a factor was not significantly associated with the odds of high PTSD in the adjusted regression model ($p=0.24$). Also, social support was not significant in the adjusted regression model ($p=0.65$). Finally, internalized stigma was a significant risk factor for high PTSD symptoms in the adjusted regression model ($p<0.001$). For each 1-unit increase in internalized stigma, the odds of high PTSD scores increased by 30% (OR: 1.30, CI: 1.19, 1.42).

We conducted post-hoc analyses to examine the relationship between stigma and social support, to better understand if the relationship between social support and stigma led to social support's non-significance in the adjusted model. Social support and stigma have a strong relationship. An exploratory linear regression comparing social support to internalized stigma showed that for each 1-unit increase in social support, internalized stigma decreased by -0.5 (CI: -0.73, -0.27, $p<0.001$).

Discussion

We found high rates of clinically-significant PTSD symptoms among African American women living with HIV in our study. Other studies have found high rates of PTSD among adults

living with HIV and have found PTSD to be a significant risk factor that drives poor adherence and engagement to care for women living with HIV (Siyahhan Julnes et al., 2016)(Glover, Williams, & Kisler, 2013; Whetten, Reif, Whetten, & Murphy-McMillan, 2008). Our study sheds more light on risk and protective factors for PTSD in this population. Our findings revealed that age, education, internalized stigma, and social support are associated with PTSD symptoms. Age and social support were not significant in the adjusted regression model, but they still may be important factors that can reduce risk of PTSD.

When examining the different age categories, our study found no significant associations with PTSD symptoms, however based on point estimates alone, our results suggested that older women may be less likely to have high PTSD symptoms. This is consistent with findings from Subramaniam et al., 2016, that older African American women are able to adapt when faced with adversity and oppression. This is likely due to their ability to adapt and having some support despite their lived experiences of trauma and discrimination. Younger age category in our sample seemed to have increased odds of PTSD and this is likely due to lack of coping and adaptability skills.

Education was a protective factor, and increased education was significantly associated with lower PTSD symptoms. This is again consistent with what other studies have found (Bynum et al., 2016). Having higher education attainment indicates access to information and knowledge about HIV and how it's transmitted. A growing body of research urges the needs for interventions that address how to engage women and their partners about sexual education to reduce the burden of disease on women (El-Bassel, Caldeira, Ruglass, & Gilbert, 2009). Also, education provides access to more economic gains in terms of financial stability. For women who had less than high school education, their increased odds of PTSD can also be worsened by

having financial stressors which puts them even at a greater risk. For example, women with low income often live in poor neighborhoods with high crime levels where they're exposed to substance use and violence (El-Bassel et al., 2009).

Internalized stigma was found to be a strong risk factor for PTSD symptoms in our study. Previous research has shown that younger women living with HIV are more likely to experience stigma than those who have lived with it longer (Galvan, Davis, Banks, & Bing, 2008). This could be due to perceived social status, or due to the lack of coping mechanisms for younger women. In other words, women who report increased levels of stigma may lack the same coping skills needed to cope with traumatic events.

In unadjusted analyses, social support was found to be significantly associated with PTSD as a protective factor. As social support increases, PTSD decreases among HIV-positive women who have support from family and friends in their communities. However, in the adjusted model social support was no longer significantly associated with PTSD symptoms. Our post-hoc analyses suggest that social support has a strong and negative relationship with internalized stigma, the strongest associated factor in adjusted analyses. We hypothesize that lack of social support may be on the pathway to the development of high levels of internalized stigma, which are very strongly related to high PTSD in this population. These findings are consistent with studies that have linked social support as a mechanism to reduce stigma in non-HIV contexts (Corrigan, Sokol, & Rüsch, 2013; Whitley & Denise Campbell, 2014).

We had several limitations in this study. The study design is cross-sectional in nature and therefore we are not able to make causal inferences about the associations that were found in the results. Furthermore, we did not measure the type of trauma the participants were exposed to, for example whether it was sexual, trauma resulting from accidents, or related to natural disaster.

There was no long-term follow up plan to measure changes in PTSD symptoms. We also did not measure coping strategies among participants, and thus cannot deduce more complex causal pathways. Since this study focuses primarily on the experiences of African American women, we can't generalize the findings to other HIV infected individuals in the US. Likewise, there might be some cultural differences and other co-morbidities that we did not consider in the design of this study. Recall bias is also a potential limitation due to retrospective rating scales.

These limitations notwithstanding, this study also had several strengths. First, this analysis represents one of the few studies to examine risk and protective factors for mental health status of African American women living with HIV, this study adds information to the literature in the area. Overall, we found that age, social support, and education may be associated with resiliency factors to help reduce risk of PTSD. HIV-related stigma and PTSD may have common risk factors as well as protective factors that reduce African American women's risk of internalized stigma and developing PTSD. Future studies can further explore this relationship between PTSD among people living with HIV and its impact on adherence to care. In addition, further assessment is needed on how resilience can be further increased for those living with HIV to improve their adherence and health outcomes is much needed.

Conclusion

HIV continues to cause significant public health issues in the United States, and often disproportionally impacts the most vulnerable of the population. In our case, we focused our study on African American women. Thus, we pinpointed stigma as a risk factor for PTSD, suggesting that stigma reduction in this population is paramount to improving prevention, care, and treatment. We also identified education and social support as protective factors against PTSD, thus suggesting routes of intervention to help women gain resilience towards developing

PTSD. Future studies are needed to further validate effective pathways towards prevention and intervention for African American women living with HIV.

Table 1. Background characteristics of the 239 women participating in the study

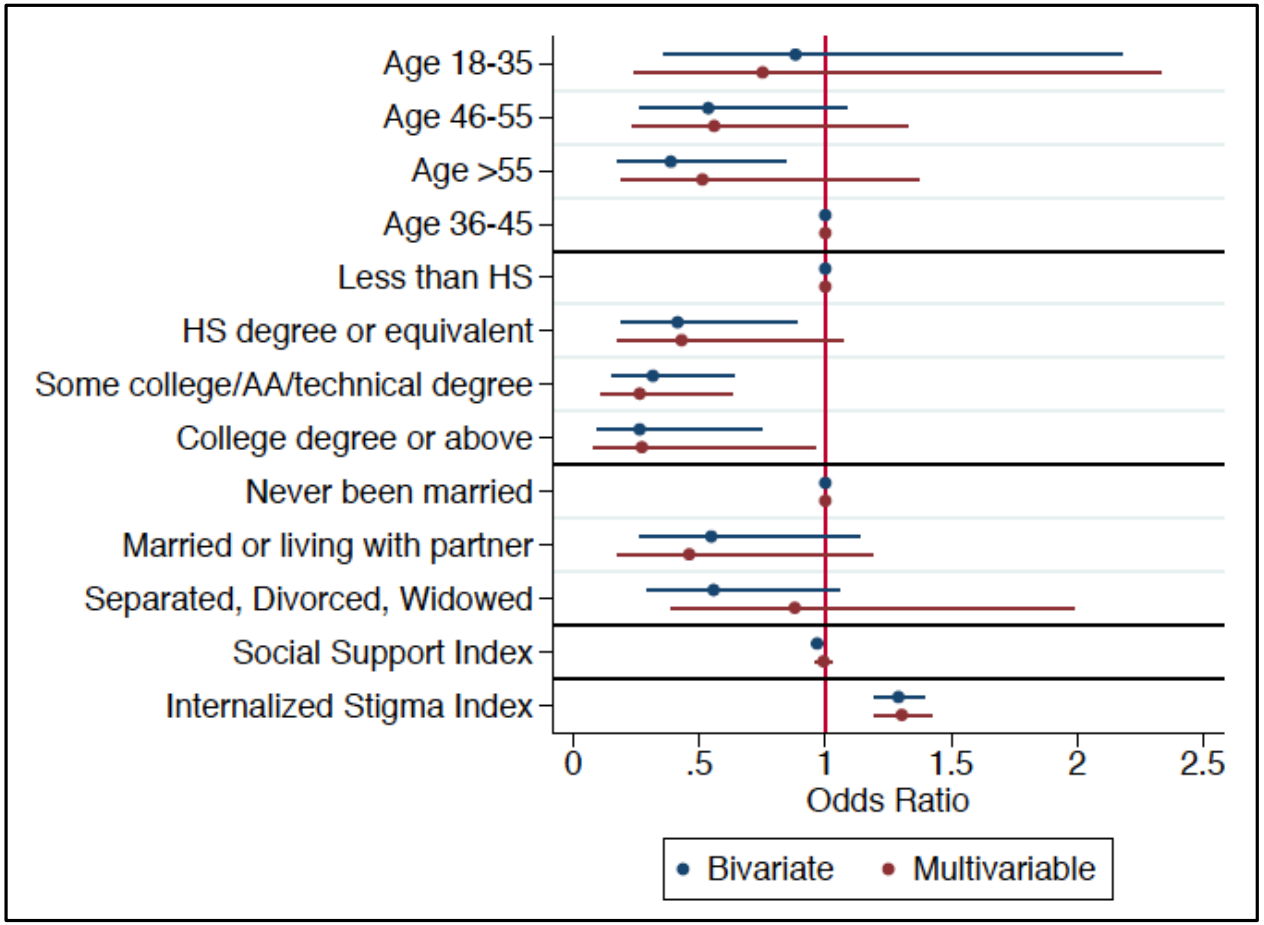
Characteristics	Total; n (%) unless noted	PTSD High; n (%) unless noted	PTSD Low; n (%) unless noted
Total	**239 (100)**	**160 (67.0)**	**79 (33.1)**
Factor Variables			
Age			
18-35	38 (15.9)	28 (73.7)	10 (26.3)
36-45	71 (29.7)	54 (76.1)	17 (24.0)
46-55	81 (33.9)	51 (63.0)	30 (37.0)
56+	49 (20.5)	27 (55.1)	22 (44.9)
Education			
Less than HS	89 (37.2)	72 (80.9)	17 (19.1)
HS degree or equivalent	55 (23.0)	35 (64.0)	20 (36.4)
Some college / technical degree	70 (29.3)	40 (57.1)	30 (43.0)
College degree or above	19 (7.94)	10 (53.0)	9 (47.4)
Missing	6 (2.51)	3 (50.0)	3 (50.0)
Marital Status			
Never been married	85 (35.6)	64 (75.3)	21 (25.0)
Married or Living with Partner	56 (23.4)	35 (63.0)	21 (38.0)
Separated/Divorced/Widowed	97 (40.6)	61 (63.0)	36 (37.1)
Missing	1 (0.41)	0 (0)	1 (1.3)
Continuous variables			
Social Support (Mean; 95% CI)	30.6 (29.0, 32.1)	29.1 (27.2, 31.0)	33.6 (30.9, 36.3)
Missing	1 (0.41)	0 (0)	1 (1.3)
Internalized Stigma (Mean; 95% CI)	13.8 (13.0, 14.6)	16.0 (15.0, 17.0)	9.3 (8.5, 10.1)
Missing	1 (0.41)	0 (0)	1 (1.3)

Table 2. Logistic Regression Models

Characteristics	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-Value
Total				
Factor Variables				
Age*				
18-35	0.88 (0.36, 2.2)	0.79	0.75 (0.24, 2.33)	0.62
36-45	1 (reference)		1 (reference)	
46-55	0.54 (0.26, 1.09)	0.08	0.56 (0.23, 1.33)	0.19
56+	0.39 (0.18, 0.89)	0.02	0.51 (0.19, 1.37)	0.18
Education*				
Less than HS	1 (reference)		1 (reference)	
HS degree or equivalent	0.41 (0.19, 0.89)	0.02	0.43 (0.17, 1.07)	0.07
Some college / technical degree	0.31 (0.15, 0.64)	0.001	0.26 (0.11, 0.63)	0.003
College degree or above	0.26 (0.09, 0.75)	0.01	0.27 (0.08, 0.96)	0.04
Missing	excluded		excluded	
Marital Status*				
Never been married	1 (reference)		1 (reference)	
Married or Living with Partner	0.55 (0.26, 1.1)	0.11	0.45 (0.18, 1.19)	0.11
Separated/Divorced/Widowed	0.56 (0.29, 1.1)	0.07	0.88 (0.39, 1.99)	0.76
Missing	excluded		excluded	
Continuous variables				
Social Support (Mean; 95% CI)	0.97 (0.94, 0.99)	0.008	0.99 (0.96, 1.02)	0.65
Missing	excluded		excluded	
Internalized Stigma (Mean; 95% CI)	1.3 (1.2, 1.4)	<0.001	1.30 (1.19, 1.42)	<0.001
Missing	excluded		excluded	

* Overall significance of factor variables in adjusted model by likelihood ratio test: Age p-value: 0.50; education p-value: 0.013; marital status p-value: 0.24

Figure 1. Forest Plot of Odds Ratios with Confidence Intervals.



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