Ethnic minority members may be at risk for state hopelessness following hospitalization for ischemic heart disease☆

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ABSTRACT

Objective: To examine differences in state and trait hopelessness between ethnic minority and White patients hospitalized with ischemic heart disease (IHD).
Methods: A descriptive cross-sectional design was used to enroll 517 patients at one Midwestern U.S. hospital. The State-Trait Hopelessness Scale measured hopelessness.
Results: State hopelessness was higher in ethnic minority patients compared to Whites. Ethnic minority patients who had never been married had higher state hopelessness than those who were married or separated/divorced. There were no differences in trait hopelessness.
Conclusions: Ethnic minority patients with IHD, who have never been married, may be at higher risk for state hopelessness.

Introduction and background

Cardiovascular disease is the leading cause of global mortality (Mozaffarian et al., 2016). Deaths caused by ischemic heart disease (IHD) have increased worldwide by an estimated 41.7% from 1990 to 2013 (Roth et al., 2015). To achieve the American Heart Association's 2020 Impact Goals of reducing deaths due to cardiovascular disease and stroke by 20%, increased emphasis is needed on secondary prevention and control of risk factors (Mozaffarian et al., 2016). Hopelessness is an important psychological factor associated with the development and progression of IHD, independent of depression (Lundgren, Garvin, Jonasson, Andersson & Kristenson, 2015; Pederson et al., 2007).

Hopelessness, defined as a negative outlook and sense of helplessness toward the future (Abramson, Alloy, & Metalsky, 1989), has been identified in 27–52% of patients with IHD (Dunn, Corser, Stommel, & Holmes-Rovner, 2006; Kangelaris, et al., 2010; Pederson et al., 2007), and can persist for up to 12 months after hospital discharge, independent of depression (Dunn, Stommel, Corser, & Holmes-Rovner, 2009). Hopelessness is associated with decreased physical functioning (Dunn et al., 2009) and lower levels of physical activity in

IHD patients in both hospital (Dunn et al., 2009) and home-based (Dunn et al., 2017) cardiac rehabilitation settings. Hopelessness is predictive of decreased survival (Freedland et al., 2009) and increased adverse clinical events in patients with IHD (Pederson et al., 2007). IHD patients who are unmarried, with a lower education level, and those who have undergone coronary artery bypass surgery or a percutaneous coronary intervention have been identified as significantly more hopeless (Dunn et al., 2006). Hopelessness may represent a temporary (or state) response to new events, and/or reflect a habitual outlook (a trait) toward many areas of life (Abramson et al., 1989). The examination of state and trait hopelessness in ethnic groups is important in order to identify subgroups most at risk for hopelessness.

Minority ethnicity is a social risk factor for poorer cardiovascular (CV) health, with only 10.5% of Black adults and 14.4% of Hispanic adults meeting criteria for ideal CV health in the US compared to 19.6% of White adults (Mozaffarian et al., 2016). Non-Hispanic Black adults also have higher rates of death due to IHD, as compared to individuals of White, Hispanic, Asian/Pacific Islander, or American Indian/Alaska native ethnicity (Mozaffarian et al., 2016). Despite ethnic minorities being at risk for poorer CV health and death due to IHD, and the known

prevalence of hopelessness and its adverse effects in patients with IHD, little is known about ethnic differences in hopelessness in healthy or ill populations. Higher levels of hopelessness have been identified in healthy ethnic minority college students (Taliaferro, Rienzo, Pigg, Miller, & Dodd, 2009) and Black adults in the general population (Anda et al., 1993) compared to Whites. Higher levels of hopelessness have also been identified in Latino adults with spinal cord injury (Kemp, Krause, & Adkins, 1999) and Black adults with chronic pain (Ezenwa & Fleming, 2012), compared to White adults. No research has been published which examined ethnic differences in hopelessness among patients with IHD.

Purpose

The purpose of this study was to examine differences in state and trait hopelessness between ethnic minority and White patients hospitalized with IHD. We hypothesized that both state and trait hopelessness would be significantly higher in ethnic minority patients. Given the associations between hopelessness and depression; hopelessness and physical functioning; and hopelessness and marital status, education level, and clinical characteristics, additional research questions included:

1. Is depression significantly higher in ethnic minority patients compared to White patients with IHD?
2. Is physical functioning significantly lower in ethnic minority patients as compared to White patients with IHD?
3. Among ethnic minority patients, are there differences in state and trait hopelessness levels across different demographic or clinical characteristics?

Methods

Design

A descriptive cross-sectional design was used. Patients with IHD (myocardial infarction, unstable angina, acute coronary syndrome, percutaneous coronary intervention, stent, or coronary artery bypass surgery) were identified by a daily review of the hospital's census reports and confirmed through medical record abstraction. Eligible patients provided consent and completed paper and pencil data collection instruments during their hospitalization. Research staff collected data as close to the patient's anticipated hospital discharge date as possible. The human subject review boards of the sponsoring academic institution and hospital approved the project.

Sample and setting

Data were collected from 517 patients hospitalized on a progressive cardiac unit at one large teaching hospital in the Midwestern US from November 2010 to September 2011. Patients were eligible for the study if they were aged 21 years or older and had a diagnosis of IHD. Patients were excluded if they were unable to speak or read English, unable to provide consent or complete an interview, or had a planned discharge to an institutional setting.

Measures

Demographic characteristics, clinical history, cardiac procedures during hospitalization, state and trait hopelessness, depressive symptoms, and physical functioning were measured. Demographics (ethnicity, age, sex, employment status, education status, marital status and insurance) and clinical history variables (history of depression, history of IHD and prior exercise) were collected using a self-report questionnaire. For ethnicity, participants reported whether they considered themselves White or ethnic minority, with choices of Hispanic, Black,

American Indian/Alaska Native, Asian or "Other." Participants were asked to self-report their marital status by selecting a category of married, never married, separated/divorced or widowed. Cardiac procedures during hospitalization were abstracted from medical records.

State and trait hopelessness

Hopelessness was measured using the 14-item State-Trait Hopelessness Scale (STHS) (Dunn et al., 2014). The STHS was developed using key components of the theory of hopelessness depression (Abramson et al., 1989). The original version STHS was a 23-item (10 state, 13 trait) instrument measured on a 4-point Likert-type scale (1 = *strongly disagree*, 4 = *strongly agree*) (Dunn et al., 2014). Earlier factor analysis identified a state hopelessness factor, trait hopelessness factor, and hopelessness absent factor (Dunn et al., 2014). For this study, the 14 state and trait hopelessness factor items (6 state and 8 trait) were analyzed because the aim was to determine differences in state and trait hopelessness between ethnic groups. Adding the item scores and dividing by the number of items provides a total score for both the state and trait hopelessness factors (range = 1 to 4). A previous study with the same sample of patients established concurrent and predictive validity (Dunn et al., 2017). The Cronbach's alpha was high for the 6-item state (0.87) and 8-item trait (0.87) scales. In addition, nearly all the values of alpha for each item in the state and trait scales decreased when an item was removed, indicating that virtually all items contribute positively to the overall reliability of the scales. Lastly, item-total correlations were moderately strong, varying between 0.42 and 0.77 for the state and 0.64 and 0.79 for the trait scales.

Depressive symptoms

Due to the known association between hopelessness and depression, depressive symptoms were measured with the 9-item Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001). Items are scored from 0 = *not at all* to 3 = *nearly every day*, providing a score range of 0 to 27. Internal consistency reliability (Kroenke et al., 2001) and criterion and construct validity (Kroenke & Spitzer, 2002) have been confirmed in prior research. Separate cognitive and somatic depressive symptom dimensions have been validated in patients with IHD (de Jonge, Mangano, & Whooley, 2007; Smolderen et al., 2009). The reliability of the total scale ($\alpha = 0.82$) and two dimensions (somatic: $\alpha = 0.68$, cognitive: $\alpha = 0.77$) were adequate in this study.

Physical functioning

Since hopelessness is predictive of decreased physical functioning in IHD patients, physical functioning was examined using the Duke Activity Status Index (DASI). The DASI, a 12-item scale, measures perceived functional capacity of IHD patients based on the patient's ability to perform activities of daily living (Hlatky et al., 1989). Each response on the DASI, scored from 1 to 4, is weighted based on the known metabolic equivalent of each activity (Hlatky et al., 1989). Composite scores are added and range from 0 (low) to 58.2 (high). Reliability of the DASI has been demonstrated in patients with IHD (Beckman, Barefoot, Haney, Williams, & Mark, 1994; Rankin, 2002) and validity has been confirmed by comparing the DASI and other established physical functioning instruments with peak oxygen uptake capacity (Hlatky et al., 1989). In our sample, the internal consistency reliability of the DASI was high ($\alpha = 0.90$).

Analysis

Data were entered into IBM SPSS Statistics software, Version 23.0 (SPSS, Inc., Chicago, Illinois), with double data entry used to ensure data quality. Less than 1% of missing data were observed on all scales. A regression-based approach was used to impute the best linear-predicted score based on the non-missing items. The R program was used for most statistical analyses, including conducting regression imputation (R Development Core Team, 2011). Chi-square and independent *t*-

tests were used to describe the sample. The percentage of ethnic minority patients was small (5.8%, n = 39) and so ethnic minority patients were placed into a single category for analysis. A priori power calculations for comparing ethnic minorities (n = 39) with Whites (n = 478) yielded a power of 85% for detecting differences in state and trait hopelessness scores between the two groups if the effect sizes were medium to large (Cohen's $D \geq 0.5$), suggesting that the study was well-powered for larger effects but under-powered for smaller effects. Furthermore, the power was 75% to detect group differences in state and trait hopelessness within ethnic minorities for very large effect sizes only (Cohen's $D = 1$).

Six baseline linear regression models predicting state hopelessness, trait hopelessness, depressive symptoms, cognitive depressive symptoms, somatic depressive symptoms, and physical functioning levels by ethnicity were used for the examination of ethnic differences (e.g. state hopelessness = $\beta_0 + \beta_1$ [ethnic minority status]; Model 1). Six multiple regression models were then used to account for the impact of potential covariates by adding all demographic, cardiac procedure, and clinical history variables to Model 1 (e.g. state hopelessness = $\beta_0 + \beta_1$ ethnic minority status + β_2 age + … β_{11} prior exercise; Model 2). Variables were selected based on prior work that established the variables as important for hopelessness and related outcomes (Dunn et al., 2006; Dunn et al., 2009; Dunn et al., 2014, Dunn et al., 2017). To identify potential confounding variables, four additional multiple regression models were run in a stepwise fashion to predict state hopelessness by minority status for each of the covariates whose distributions varied between ethnicities (marital status, employment status, insurance status and prior exercise; as listed in Table 1). Models predicting state hopelessness levels within ethnic minorities and, separately, within Whites were also estimated (Tables 3 and 4) using permutation tests to assess statistical significance due to small sample sizes in some cases. Finally, we tested for potential interactions between demographic variables and minority status on state hopelessness using the following model: state hopelessness = $\beta_0 + \beta_1$ ethnic minority status + β_2 Demographic + β_3 Demographic ∗ Ethnic minority status, fitting a separate model for each demographic variable and using a permutation test to assess statistical significance due small sample sizes in some cases.

Results

Sample characteristics and group differences

A total of 39 patients (5.8%) reported being members of ethnic minority groups, including Hispanic, Black, American Indian/Alaska Native, Asian, or "other" (Table 1). The sex and age of the sample was typical for the IHD population. Most patients were married, though the percentage was significantly higher for Whites (70%) compared to minorities (38.5%). Significantly more ethnic minority patients reported being disabled or unemployed (versus employed or retired) and reported being uninsured or receiving health insurance through the US federal program for low-income individuals (Medicaid). Significantly more ethnic minority patients also reported exercising prior to their hospitalization, as compared to White patients. Approximately half of both groups had a college education. The majority of both Whites and ethnic minorities in the sample received angioplasty or a stent.

Differences in state and trait hopelessness

Differences in state and trait hopelessness were examined between the two groups. State hopelessness was significantly higher (p = 0.03) in ethnic minority patients (mean = 1.93, SD = 0.57) compared to Whites (mean = 1.71, SD = 0.53) in unadjusted analyses (Table 2), though differences were no longer significant after adjustments for covariates (i.e. age, sex, marital status, employment status, insurance status, education level, cardiac procedure during hospitalization, history of depression, history of prior IHD and history of prior exercise).

Table 1
Distribution of demographic, cardiac procedure and clinical history variables by ethnicity.

	White (n = 478) Mean (SD) or % (n)	Ethnic minority (n = 39) Mean (SD) or % (n)	Test statistic (df; p)[a] χ^2 (df; p) or t (df; p)
Ethnicity			
White	100% (478)	N/A	N/A
Hispanic	N/A	23.1% (9)[b]	
Black	N/A	41.0% (16)	
American Indian/ Alaska Native	N/A	17.9% (7)	
Asian	N/A	2.6% (1)	
Other	N/A	15.4% (6)	
Age	63.28 (10.50)	61.00 (12.29)	1.10 (41; 0.28)
Sex: male	66.9% (320)	61.5% (24)	0.26 (1; 0.61)
Employment			
Other	6.3% (30)	17.9% (7)	*26.9 (3;*
Disabled	12.4% (59)	35.9% (14)	*6×10^{-6})*∗∗
Retired	46.4% (221)	30.8% (12)	
Employed	34.9% (166)	15.4% (6)	
College education	55.3% (264)	47.4% (18)	0.6 (1; 0.44)
Marital status			
Never married	4.0% (19)	10.3% (4)	*17.2 (3; 0.0006)*∗∗
Separated/divorced	16.7% (80)	35.9% (14)	
Widowed	9.2% (44)	15.4% (6)	
Married	70.1% (335)	38.5% (15)	
Insurance			
Medicaid	9.7% (46)	25.6% (10)	*14.97 (2;*
No insurance	7.2% (34)	15.4% (6)	*0.0006)*∗∗
Other	83.1% (394)	59.0% (23)	
Procedure			
Coronary artery bypass surgery	32.6% (156)	23.1% (9)	3.2 (2; 0.20)
PTCA-stent	51.7% (247)	51.3% (20)	
None	15.7% (75)	25.6% (10)	
Prior depression	25.4% (121)	23.1% (9)	0.02 (1; 0.89)
Prior IHD	52.0% (248)	48.7% (19)	0.05 (1; 0.82)
Prior exercise	56.8% (270)	74.4% (29)	*3.9 (1; 0.049)*∗

Values in bold and italic font are statistically significant at p < 0.05.
[a] Testing for different distribution in White and ethnic minority sub-samples using chi-square for categorical and *t*-tests for continuous variables.
[b] Hispanic.
∗ p < 0.05.
∗∗ p < 0.01.

Trait hopelessness was higher among ethnic minorities (mean = 2.02, SD = 0.60) compared to Whites (mean = 1.89, SD = 0.55), but the difference was not statistically significant (p = 0.17). While differences between ethnic minority patients and Whites for state hopelessness were larger (1.93 (mean state hopelessness for minorities) – 1.71 (mean state hopelessness for Whites) = 0.22) than for trait hopelessness (2.02 (mean trait hopelessness for minorities) – 1.89 (mean trait hopelessness for Whites) = 0.13), this difference (0.22 vs. 0.13) was not statistically significant (p = 0.49). Although depressive symptoms were higher and physical functioning was lower in ethnic minority as compared to White patients, the differences were not statistically significant (Table 2).

Multiple regression models predicting state hopelessness by minority status showed that after adjusting for 3 of the 4 covariates (marital status, insurance status, and employment status), minority status was no longer significant (p = 0.059, 0.14 and 0.23 respectively). This suggests a potential confounding effect of each variable on the relationship between ethnicity and state hopelessness. A final model, including all four covariates and ethnicity, indicated prior exercise and insurance status as the strongest confounders on the relationship between ethnicity and state hopelessness. Non-exercisers and those receiving Medicaid had the highest state hopelessness.

Additional post-hoc analysis using permutation tests was completed for patients in the ethnic minority group (Table 3). The analysis

Table 2
State and trait hopelessness, depression and physical functioning by ethnicity.

	White (n = 478) Mean (SD)	Ethnic minority (N = 39) Mean (SD)	Difference in means (95% CI; Cohen's D)	Model 1 p-Value[1]	Model 2 (adjusted) p-Value[1]
State hopelessness	1.71 (0.53)	1.93 (0.57)	***0.22*** ***(0.05, 0.39; 0.40)****	***0.02****	0.12
Trait hopelessness	1.89 (0.55)	2.02 (0.60)	0.13 (−0.06, 0.31; 0.23)	0.17	0.71
Depression	5.79 (4.91)	6.15 (4.90)	0.36 (−1.28, 2.01; 0.07)	0.66	0.72
Cognitive sub-scale	2.12 (2.73)	2.21 (2.51)	0.08 (−0.81, 0.97; 0.03)	0.86	0.42
Somatic sub-scale	3.67 (2.71)	3.95 (3.16)	0.28 (−0.62, 1.18; 0.10)	0.54	0.89
Physical functioning	44.59 (16.43)	41.64 (16.36)	−2.95 (−8.44, 2.53; −0.18)	0.28	0.86

[1] p-Value is from a regression model predicting hopelessness, depression or activity levels by minority status (Model 1). Adjusted p-value in the same regression model, but with the addition of all demographic, cardiac procedure and clinical history covariates in Table 1 (Model 2).

* $p < 0.05$.

demonstrated a significant difference (p = 0.03) in state hopelessness within ethnic minority patients based on marital status, with those reporting "never married" as having higher state hopelessness levels (mean = 2.58, SD = 0.52) than those who were married (mean = 1.93, SD = 0.53) or separated/divorced (mean = 1.68, SD = 0.52). Most demographic variables were significantly associated with state hopelessness for the White group, but the sample size was much larger (see Table 4 for details). We then tested for potential evidence of differential relationships between the demographic variables shown in Table 3 and state hopelessness by ethnicity status using permutation tests. Only marital status was statistically significant (p = 0.022), indicating that marital status impacted state hopelessness differently in ethnic minorities compared to Whites. State hopelessness levels for the never married group are comparable to state hopelessness levels for separate/divorced and married patients in Whites (never married mean 1.85 versus separated/divorced mean 1.84; p = 0.97 and never married mean 1.85 versus married mean 1.67; p = 0.15), but state hopelessness levels for the never married group were quite a bit higher than separated/divorced and married in the ethnic minority group (never married mean 2.58 versus separated/divorced mean 1.68; p = 0.008 and never married mean 2.58 versus married mean 1.93; p = 0.046). Furthermore, state hopelessness levels for separated/divorced were significantly higher than levels in married individuals in Whites (separated/divorced mean 1.84 vs. married mean 1.67; p = 0.009), whereas separated/divorced individuals had significantly lower state hopelessness levels than married individuals in the minority sample (separated/divorced mean 1.68 vs. married mean 1.93; p = 0.021).

Discussion

State hopelessness was significantly higher in ethnic minority patients compared to Whites, though differences were no longer significant after adjusting for covariates (i.e. age, sex, marital status, employment status, insurance status, education level, cardiac procedure during hospitalization, history of depression, history of prior IHD and history of prior exercise). Trait hopelessness was higher among ethnic minorities compared to Whites, but the difference was not statistically significant. The key finding of this study was that increased feelings of state hopelessness in ethnic minority patients may be partially explained by marital status. Marital status impacted state hopelessness differently in ethnic minorities compared to Whites. Ethnic minorities reporting being "never married" had significantly higher state hopelessness levels than those who were married or separated/divorced, whereas there were no significant differences in state hopelessness for the never married compared to the separated/divorced or married in

Table 3
Differences in state hopelessness levels for ethnic minorities (n = 39).

	Mean (SD; n)	ANOVA p-value (permutation test p-value[1])
Age	−0.12[2]	0.44 (0.44)
Sex		
Female	2.00 (0.52; 15)	0.55 (0.55)
Male	1.88 (0.61; 24)	
Employment		
Other	2.02 (0.68; 7)	0.38 (0.67)
Disabled	2.04 (0.59; 14)	
Retired	1.77 (0.62; 12)	
Employed	1.89 (0.27; 6)	
Education		
College	1.79 (0.58; 18)	0.13 (0.13)
High school	2.08 (0.56; 20)	
Marital status		
Never married	2.58 (0.52; 4)	***0.03 (0.03)[3]***
Separated/divorced	1.68 (0.52; 14)	
Widowed	2.08 (0.53; 6)	
Married	1.93 (0.53; 15)	
Insurance		
Medicaid	2.06 (0.50; 10)	0.29 (0.44)
No insurance	2.08 (0.40; 6)	
Other	1.82 (0.65; 22)	
Procedure		
Coronary artery bypass surgery	1.57 (0.38; 9)	0.10 (0.07)
PTCA-Stent	1.98 (0.57; 20)	
None	2.15 (0.62; 10)	
Prior depression		
Yes	2.15 (0.65; 9)	0.19 (0.18)
No	1.86 (0.54; 30)	
Prior IHD		
Yes	2.09 (0.62; 19)	0.09 (0.09)
No	1.78 (0.49; 20)	
Prior exercise		
Yes	1.94 (0.57; 29)	0.80 (0.80)
No	1.89 (0.61; 10)	

[1] Over 10,000 permutations. Used to ensure minimal impact of small sample sizes on conclusions.

[2] Pearson correlation.

[3] Post-hoc comparison of all pairwise groups using permutation tests yielded the following p-values: never married vs. separated/divorced (p = 0.008), never married vs. widowed (p = 0.19), never married vs. married (p = 0.046), separated/divorced vs. widowed (p = 0.14), separated/divorced vs. married (p = 0.021), widowed vs. married (p = 0.54).

Whites. State hopelessness levels in the White group were significantly higher for the separated/divorced group than those in the married group, whereas separated/divorced individuals had significantly lower

Table 4
Differences in state hopelessness levels for whites (n = 478).

	Mean (SD; n)	ANOVA p-value
Age	0.03[1]	0.53
Sex		
°Female	1.75 (0.52; 158)	0.25
°Male	1.69 (0.53; 320)	
Employment		
°Other	1.79 (0.40; 30)	*< 0.001*
°Disabled	2.05 (0.54; 59)	
°Retired	1.72 (0.54; 221)	
°Employed	1.57 (0.47; 166)	
Education		
°College	1.63 (0.52; 264)	*< 0.001*
°High school	1.82 (0.53; 213)	
Marital status		
°Never married	1.85 (0.58; 19)	*0.04[2]*
°Separated/divorced	1.84 (0.57; 80)	
°Widowed	1.75 (0.51; 44)	
°Married	1.67 (0.52; 335)	
Insurance		
°Medicaid	2.09 (0.53; 46)	*< 0.001*
°No insurance	1.77 (0.44; 34)	
°Other	1.66 (0.52; 394)	
Procedure		
°Coronary artery bypass surgery	1.69 (0.52; 156)	*0.028*
°PTCA-stent	1.69 (0.52; 247)	
°None	1.84 (0.58; 75)	
Prior depression		
°Yes	1.96 (0.52; 121)	*< 0.001*
°No	1.63 (0.51; 355)	
Prior IHD		
°Yes	1.72 (0.55; 248)	0.84
°No	1.71 (0.51; 229)	
Prior exercise		
°Yes	1.66 (0.51; 270)	*0.02*
°No	1.78 (0.55; 205)	

[1] Pearson correlation.

[2] Post-hoc comparison of all pairwise groups yielded the following p-values: never married vs. separated/divorced (p = 0.97), never married vs. widowed (p = 0.50), never married vs. married (p = 0.15), separated/divorced vs. widowed (p = 0.37), separated/divorced vs. married (p = 0.009), widowed vs. married (p = 0.35).

hopelessness levels than those who were married in the ethnic minority sample.

Higher state hopelessness levels identified in ethnic minority patients may be explained by a demographic covariate, marital status, that is disproportionately distributed in ethnic minority groups (more "never married") (Raley, Sweeney & Wondra, 2015). Although conclusions cannot be drawn from the small number of never married ethnic minorities in this sample (n = 4), it is important to identify those patients who are at potentially highest risk. If the true relationship is that never being married is a risk factor for state hopelessness in ethnic minorities, and more ethnic minorities are never married, the findings of this study are important for ethnic minority patients.

Patients hospitalized with an acute IHD event are often faced with a new and chronic diagnosis, with recommendations for lifestyle changes. Ethnic minority patients who have never been married may have less social or financial resources to draw on when coping with health challenges and potential lifestyle changes (Havranek et al., 2015; Virtanen et al., 2015). Cultural barriers (e.g. dietary, physical activity, or social network practices) and linguistic barriers (e.g. low health literacy and numeracy) have been identified as contributing to poorer cardiovascular health in some ethnic minority groups (Havranek et al., 2015). Although not studied in relationship to hopelessness, cultural or linguistic barriers could potentially contribute to higher state hopelessness and be exacerbated by never having been married.

State hopelessness may also be associated with ethnic differences in employment status, insurance status, and prior exercise. Ethnic minority patients who are not working/retired or on Medicaid may have fewer social or financial resources to draw on, including a lack of a disposable income (Gaalema et al., 2016; Havranek et al., 2015; Virtanen et al., 2015). Minority patients who were not exercising prior to their hospitalization may feel more state hopelessness when faced with recommendations to exercise in a hospital-based cardiac rehabilitation setting or at home, particularly if they have barriers associated with attending a hospital-based cardiac rehabilitation program (e.g., lack of transportation or limited finances) (Gaalema et al., 2016) or barriers associated with home exercise (e.g., an unsafe environment, lack of availability of an indoor facility, or lack of emotional support) (Havranek et al., 2015).

Further research is needed with larger numbers of ethnic minority patients with IHD across different marital/partnership, employment, insurance/income and exercise/non-exercise groups to better understand the complex relationship between ethnic minority status and state hopelessness. Future research is also needed to identify which patient characteristics are more strongly associated with state hopelessness levels in the ethnic minority IHD population. This will facilitate the development of personalized interventions to prevent or reduce state hopelessness.

There are limitations to consider when interpreting the results of this study. The sample was drawn from one Midwestern US hospital. Patients in both the ethnic minority and White groups were well-educated, which may limit generalizability. The sample size for the ethnic minority category was considerably smaller than that of the category of White patients, which limited power to identify small effect sizes, though the power was adequate (85%) to detect medium to large effect sizes. The power was 75% to detect group differences in state and trait hopelessness within ethnic minorities for very large effect sizes only. Four patients (all ethnic minorities) were excluded from the study because they did not speak English. Examination of state and trait hopelessness in non-English speaking IHD patients from a variety of cultural backgrounds is needed. Information regarding the national origin of Whites was also not collected for this study and should be examined in future research. Marital status categories were limited to married, never married, separated/divorced or widowed. Investigation of state and trait hopelessness in patients who are unmarried but cohabitating may provide important information on underrepresented or disadvantaged groups. State and trait hopelessness were measured only once, during the patient's hospitalization, and because state hopelessness can change over time, findings may differ later in the patient's recovery period.

Relevance to clinical practice

Higher levels of mean state hopelessness in never-married ethnic minority patients with IHD have potentially important clinical implications for health care providers. Given political instability across the globe, with increased migration of internally displaced people and refugees, there are increasing numbers of minority groups in previously homogeneous areas (UNCR, 2017). Because of the prevalence (Dunn et al., 2006; Kangelaris et al., 2010; Pederson et al., 2007) and persistence (Dunn et al. 2009) of hopelessness in patients with IHD, and its association with decreased survival (Freedland et al., 2009) and increased adverse clinical events (Pederson et al., 2007), state and trait hopelessness should be assessed in IHD patients of all ethnicities. Cultural sensitivity of providers in assessing hopelessness in ethnic minority individuals will enable the provision of more precise, evidence-based care.

State and trait hopelessness should be assessed during a patient's hospitalization and in the recovery period after the patient's discharge home. State hopelessness may be responsive to short-term cognitive interventions (Freedland et al., 2009), whereas patients with trait hopelessness may require a referral to long-term cognitive therapy (Abramson et al., 1989). Short-term cognitive behavioral strategies

recommended by the American Heart Association include motivational interviewing, goal setting, self-monitoring, self-efficacy enhancement, assessment of barriers to change, and regular follow-up with a health care provider (Artinian et al., 2010). However, cognitive behavioral interventions designed to change behavior in one ethnic group may be less effective in another group, especially when an ethnic minority group is educationally, socially, or economically disadvantaged or possesses cultural or linguistic barriers (Artinian et al., 2010). Cognitive behavioral interventions should be culturally sensitive to potential differences in values, beliefs/cognitions, knowledge, and behaviors within each ethnic group (Butler, et al., 2016).

Conclusion

This study is the first of its kind to examine state and trait hopelessness in ethnic minority compared to White patients with IHD. Ethnic minority patients with IHD, who have never been married, may be at higher risk for state hopelessness compared to White patients. Understanding ethnic differences is important in identifying subgroups most at risk for hopelessness. Knowledge of state and trait hopelessness in ethnic minority IHD patients is important for nurses in both acute care and outpatient settings so that they can identify and counsel at-risk patients.

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