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Racial identity and mental well-being: The experience of African American Medical Students:

A Report from the Medical Student CHANGE Study

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Conflict of interest

Dr. Hardeman, Dr. Perry, Dr. Phelan, Mx. Przedworski, Dr. Burgess and Dr. van Ryn declare that they have no conflict of interest.

Compliance with Ethical Standards

There are no potential conflicts of interest.

Research involving Human Participants: All procedures in studies involving human participants were in accordance with the ethical standards of the institutional and or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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None

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Abstract

Purpose—Diversification of the physician workforce continues to be a national priority; however a paucity of knowledge about the medical school experience for African American medical students limits our ability to achieve this goal. Previous studies document that African American medical students are at greater risk for depression and anxiety. This study moves beyond these findings to explore the role of racial identity (the extent to which a person normatively defines her/himself with regard to race) and its relationship to well-being for African American medical students in their first year of training.

Methods—This study used baseline data from the *Medical Student CHANGE Study*, a large national longitudinal cohort study of 4732 medical students at 49 medical schools in the U.S. Racial identity for African American students (n=301) was assessed using the centrality sub-scale of the Multidimensional Inventory of Black Identity. Generalized linear regression models with a Poisson regression family distribution were used to estimate the relative risks of depression, anxiety and perceived stress.

Results—First year African American medical students who had lower levels of racial identity were less likely to experience depressive and anxiety symptoms in their first year of medical school. After controlling for other important social predictors of poor mental health (gender and SES), this finding remained significant.

Conclusions—Results increase knowledge about the role of race as a core part of an individual's self-concept. These findings provide new insight into the relationship between racial identity and psychological distress, particularly with respect to a group of high achieving young adults.

Keywords

depression; anxiety; medical student; racial identity

INTRODUCTION

Increasing the racial and ethnic diversity of the physician workforce has been a national priority for many years.[1,2] Knowledge about the experience of being an African American medical student is fundamental to developing effective strategies to recruit, retain, and support a diverse physician workforce. However, insight into the medical school experiences of minority students is limited.[3,4]

In a previous study[5] we document that African American medical students in their first year of medical school are at greater risk for poor well-being (depression and anxiety). Little is known however, about the processes that contribute to the aforementioned findings. Recently, several authors in the medical education literature have turned their attention to issues of identity.[6–10] Social identity theory in particular has been used to shed light on

medical students' developing professional identities.[11] A social identity is the portion of an individual's self-concept derived from perceived membership in a relevant social group. [12] Many forms of social identity exist, reflecting the many ways in which people connect to other groups and social categories.[13] For many African Americans, race is a central element of self-definition and becomes an important social identity (e.g. racial identity).[13]

It is documented that a strong or very positive racial identity can play a positive role in the emotional, mental and psychological well-being of African American students.[14–17] Stronger racial identity consistently predicts better psychological functioning [18–24] and is documented to serve as a protective factor for African American children, enabling them to maintain positive school achievement and psychosocial health by diminishing the effects of discrimination.[17,25–27] It is not known if this is true for African American medical students—a unique subset of the African American population. It is possible that identifying too highly with one's race in a setting where they are a minority may put the student at greater risk of feeling disconnected and socially isolated from their peer group (other medical students). Given that the medical school environment is often described as a unique, high-pressure environment,[28] understanding the impact of racial identity as a social process that either protects against or exacerbates well-being among African American medical students is essential.

Medical students' identities are not only important for their professional development as physicians, but also may play a significant role in their well-being.[11] To date, no studies have explored the role of racial identity in the experience of African American medical students. Using a national sample of first year medical students, the present study seeks to examine the impact of racial identity on symptoms of depression and anxiety and perceived stress for African American first year medical students. Based on the literature, we hypothesize that African American medical students with a higher racial identity centrality score will experience less depressive symptoms, lower levels of anxiety and report less perceived stress compared to African American medical students with a lower racial identity centrality score.

DATA and METHODS

Data source

This study uses baseline data collected as part of the *Medical Student Cognitive Habits and Growth Evaluation Study* (CHANGES), a large longitudinal study of student experiences who matriculated in US medical schools in the fall of 2010. For detailed study protocol information, please see Phelan et al[29]. We sampled medical students using a stratified multistage sampling design. In the first stage, we selected 50 medical schools from a total of 131 MD-granting US schools using a proportional to (class) size sampling methodology. [30] One of the 50 schools sampled for our study was a military school that had highly unique features, including acceptance policies, curriculum structure and student characteristics. Due to concerns about the generalizability of our study findings, we excluded this school (n=169) from analysis. In the second stage, we recruited first year students from the selected schools using a combination of student provided emails, a commercially available list of medical students, and a snowball sampling strategy. Please see

Phelan et al[29] for full description of ascertainment and recruitment strategies. The University of Minnesota and Mayo Clinic Internal Review Boards approved the study. All students who completed the survey received a \$50 incentive for participation.

Study Sample

Between October 2010 and January of 2011, a total of 4,732 first year medical students completed the baseline survey representing 81% of the 5,823 students invited to participate in the study and 55% of all 8,594 first year students enrolled at the 49 sampled schools (Please see Phelan et al[29] for participant recruitment flowchart). Our overall response rate was comparable to other published studies of medical students.[31,32] The demographic characteristics of students in our sample were similar to the demographics of all students who enrolled in medical schools in 2010, as reported by the AAMC (see Supplemental Digital Content 3 in Przedworski J, et al, 2015).[33] The racial composition of the 49 schools in the sample ranged from 0 percent to 13 percent for African American students and 39 percent to 88 percent for White students as described in Table 1.

Analysis for this particular study focused on first year medical students who self-identified as African American (N = 301). Participants who identified their race as “African American or Black” or who identified as multi-racial and selected “Black or African American” as one of their races were categorized as “African American or Black” for the purposes of these analyses. CHANGES is designed to examine changes in medical students’ well-being, experiences, and attitudes during medical school. The racial identity questions were included in a subset of questions asked of all participants who self-identified as African American or multi-racial and African American.

Study Measures

Depression and anxiety—Depressive symptoms were assessed using the PROMIS Depression short form, a validated, 8-item instrument.[34] For study analysis, we defined students who had a score greater than 53.5 as exhibiting depressive symptomology.[35] This represents a score that exceeds the minimally important difference from the mean as established by Yost.[35]

Anxiety was assessed using the PROMIS Anxiety short form, a validated 7-item instrument.[36] The mean anxiety score in our sample of medical students was higher than the general population average (57.6 vs. 50), so a cut-off of 70 (i.e., two standard deviations above the general population mean) was selected as a cutpoint, in order to increase the likelihood of capturing a meaningful difference between anxious and non-anxious medical students, and representing a score that exceeds the minimally important difference from the mean.[35]

Perceived stress—Stress was measured using the Short Form Perceived Stress Scale[37] (PSS-4) (Cronbach’s Alpha = 0.66), a four item self-report measure that assesses the amount of stress the individual has felt in the past month. Participants responded on a 4-point Likert-type scale ranging from 0 ‘Never’ to 4 ‘Very often’. A higher score on the scale is indicative of higher levels of perceived stress. Because there are no score cut-offs for the PSS-4, and only comparisons within one’s own sample, we calculated the mean score of perceived

stress in our sample (2.50 (SD = 0.66)). We then created a mean scale score which we dichotomized into low (≤ 2.5) and high (>2.5) perceived stress.[37–39]

Racial identity—This study used four items from the centrality subscale of the Multidimensional Inventory for Black Identity (MIBI) to assess racial identity. [40] The MIBI was developed to measure the three stable dimensions of the Multidimensional Model of Racial Identity (MMRI) (centrality, ideology, and regard) in African Americans college students and adults.[40] The MMRI represents a synthesis of ideas from many existing models of African American racial identity and defines racial identity as that part of the person's self-concept that is related to her/his membership within a race. It is concerned with both the significance the individual places on race in defining him/herself and the individual's interpretations of what it means to be Black.[40] We selected items from the centrality scale given our interest in understanding the significance of race in the individual's self-definition rather than the qualitative meaning that the individual ascribes to being African American.

Items measured the extent to which being African American is central to the respondents' definition of themselves (e.g., "Being Black is important to my self-image"). A higher score on the centrality scale is indicative of race being a more important aspect of the individuals' definitions of self. We created a mean scale score (Cronbach's $\alpha = 0.88$). We dichotomized scores into groups of low (<3.5) and high (>3.5) racial identity. [41]We also examined scores continuously and found similar results, however we elected to use a dichotomous score given ease of interpretability of findings.

Covariates—Students self-identified as African American. Standard demographic questions were used to measure gender, age (dichotomized as 24 and younger and older than 24), relationship status (in a relationship or single) and parental status (whether the student has children). Socioeconomic status was categorized into three groups: low-middle SES (family income of less than \$10,000-\$74,999), upper-middle SES (\$75,000-\$249,999) and upper SES (\$250,000-\$500,000 or more).[42]

Analyses

Frequencies and summary statistics for sample characteristics were calculated. Bivariate analyses were done to assess the associations between racial identity and depression, anxiety, and perceived stress. Treating the three dependent variables as dichotomous outcome measures, we estimated Relative Risks (RR) using generalized linear models (GLM) with a Poisson regression family distribution, log link, and a robust sandwich estimation of the error variance, an analytic approach demonstrated to reliably estimate relative risks for binary outcomes.[43,44] We implemented these analyses after observing a convergence problem when fitting log-binomial generalized linear models. In multivariate analyses, we adjusted models for age, relationship status, parental status, family income and parental education. All models took into account the sampling probability, stratification, and clustering in the two-stage survey design.

RESULTS

Sample Characteristics

Table 2 presents characteristics for the 301 African American medical students in our sample.

Table 3 shows the mean scores of depression, anxiety and perceived stress stratified by levels of racial identity, gender and SES. Students with low racial identity scored lower than students with high racial identity on depression [50(8.84) versus 54(8.82), ($p = .05$)], anxiety [58(8.52) versus 60(8.55), ($p < .001$)], and perceived stress [2.1(.69) versus 3.0(.63), ($p = .05$)].

Table 4 illustrates the Poisson regression models for depression. In the unadjusted model (Model 1), students with lower racial identity had a lower risk for depression (RR, 0.62 [95% CI, .54 to .71]; $p < .05$). The statistically significant association between racial identity and depression persisted in Model 2, which included the main effects of racial identity, gender and SES (family income). Students who had low racial identity were at lower risk for depression (RR, .58 [95% CI .50 to .68]; $p = .05$). After the addition of covariates in Model 3, the effect of racial identity persisted (RR, .60 [95% CI .52 to .69]; $p = .05$) and the effect of family income remained significant (RR, 4.01 [95% CI, 1.47 to 10.95]; $p = .05$). Given that low-middle income students were at greater risk for depression, we tested the significance of racial identity*SES in model 4. This interaction term was not statistically significant.

The same models were run for anxiety. Model 1 showed that those with low racial identity were at lower risk for anxiety (RR, .88 [95% CI, .84 to .99], $p = .05$). The statistically significant association between racial identity and anxiety persisted in Model 2 (RR, .85 [95% CI, .80 to .95], $p = .05$). The effect was also present in Model 3 after controlling for covariates (RR, .88 [95% CI, .84 to .93], $p = .05$).

The same models were also run for perceived stress (Table 6). Model 1 showed that those with low racial identity were at lower risk for perceived stress (RR, .72 [95% CI, .60 to 1.15], $p = .05$). This relationship persisted in Model 2 (RR, .69 [95% CI, .45 to 1.07]) with added main effects of gender and SES. After controlling for covariates in Model 3, the findings were no longer statistically significant.

DISCUSSION

Contrary to our hypotheses, African American medical students for whom racial identity was more central to their definition of themselves were more likely to experience depression and anxiety symptoms in their first year of medical school.

Contrary to an established literature demonstrating the protective function of racial identity on the mental health of African Americans, our study found that high centrality of racial identity was not associated with perceived stress, and was associated with worse mental health outcomes for first year African American medical students. We speculate on a number of potential reasons for these findings.

Our hypothesis that brought about the protective function of racial identity was based on the idea that belonging to a particular social category or group provides a support network, facilitates effective coping strategies against stressors and promotes positive self-esteem. [11,45] However, in a medical school setting in which the majority of students are White, African American students with high levels of racial identity may not have such a support network because their racial identity is not widely shared among their medical school peers, negating the beneficial effects of a strong racial identity in strengthening group membership

In addition, as part of their training, medical students are expected to adopt the values, attitudes, and normative behavior of the medical profession[46], often resulting in students internalizing a new profession.[7] In medical school, this would suggest that students who feel a strong sense of shared social identity (professional identity) as medical students will be better able to cope with the stressors of medical school, more likely to receive support from fellow medical students and experience greater well-being.[47] African American students with a high racial identity might face greater difficulty “fitting the mold” of a medical student identity that is characterized by a white racial majority.[46,48–51] This would limit African American students’ ability to benefit from the protective function of a high level of shared identity with their medical school peers. Being a minority student in a predominately majority institution is associated with social and cultural isolation, difficulty finding faculty mentors and peer support, and a feeling of being an “uninvited guests in a strange land.”[46,52,53] Given the findings of our study, the impact of being a racial minority student in an overwhelmingly white institution might be particularly deleterious on the mental health of students whose racial identity is foundational to their self-definition.

African American medical students may also struggle with the strain of conflicting social identities, or so-called identity interference.[54] If African American medical students with positive/high racial identity are behaving in ways that are consistent with their group norms as African American they may be discordant with the social identity of medical student. Indeed, Mavor suggests that although all medical students are considered to be members of the medical student community, the extent to which each individual student identifies with the group varies and will likely moderate his or her degree of adherence to norms.[11] For African American students, this is particularly salient as they may identify with both groups and the discordance they face when dealing with this may be contributing to their depression and anxiety.[54] More research is necessary that explores how racial identity interacts with the professional identity of being a medical student.

Finally, greater exposure to discrimination may also put African American medical students with a high racial identity at a greater risk of depression and anxiety. Individuals who identify with and publicly claim a devalued identity are more likely to be the target of discrimination due to others’ reactions to the increased salience of their identity.[55] For instance, Burrow and Ong (2010) found that African American doctoral students with high racial centrality were more likely to report daily encounters of racial discrimination.(cite) Social identity theorists suggest that individuals who are psychologically attached to a group will be more likely to publicly claim that identity, and less likely to suppress it, during interpersonal interactions even when the group is perceived as devalued.[56] In this way, highly identified individuals (e.g. individuals with high racial identity) may choose not to

compromise their sense of self as they interact with others. Instead, they appear to maintain internal consistency by presenting a public image that corresponds with their self-perception. This could be potentially isolating for these individuals leading to higher levels of depression and anxiety. It also may make them more apparent targets for discrimination. [57–59] In Burrow's study it was ultimately concluded that racial centrality exacerbated the effects of daily racial discrimination on negative affect and depression.[60]

While the social processes of medical training have been studied,[61–64] little has been documented regarding the African American experience. Understanding school factors and the school environment may shed light on how racial identity is working among these students. Also, given that poor mental health has been found to worsen over the four years of medical training,[65] exploring if and how racial identity fluctuates along with mental health is critical for a better understanding of this topic. Finally, it is important to consider the type of African American individual that applies to and are accepted into medical school. It is quite possible that there are certain characteristics intrinsic to a personality type that is impacting how racial identity impacts their psychosocial well-being. Indeed, more research on the role of racial identity for high achieving young adults may shed more light on this matter.[66]

This study has important implications for understanding how institutional forces can better support and protect the well-being of African American medical students who are already at higher risk for burnout, academic challenges, and other challenges in medical school.[67] If students with high racial identity are at greater risk for anxiety then we must determine what it is about high racial identity that causes distress. If it is indeed discrimination, the medical school environment must work to become more inclusive, eliminating occurrences of discrimination. If it is related to social isolation then improving diversity through the creation of a critical mass of African American students in medical school is vital. The creation of an identity-safe environment in which there are both subtle and overt cues promoting diversity are important. For example, increasing the number of minority faculty and individuals in positions of power and messaging that indicates that the school values diversity. Simultaneously, an absence of cues that indicate a threatening environment (e.g. indications of racism; low minority representation; and a “color blind” philosophy) are necessary.[68]

The primary limitation of this research is the cross-sectional nature of these data. These associations may co-occur or occur in the opposite direction than what is presented. However, these data were collected in a large national sample of medical students, using validated measures, and it is the first investigation of racial identity and well-being in African American medical students. Additionally, the overall CHANGES study is longitudinal creating future opportunities to assess how racial identity continues to impact well-being throughout medical school. It is also important to note that the confidence intervals are wide, indicating that the sample size may be too small. In future research, the conclusions drawn from these data will benefit from replication in a larger sample size as well as qualitative focus groups to document the lived experience of African American medical students. Finally, we were unable to collect data on students' college experiences

and therefore cannot account for students undergraduate experiences and how they might contribute to their mental health in medical school.

Conclusion

Our results increase knowledge about the role of race as a core part of an individual's self-concept for African American medical students. More specifically, these findings provide new insight into the relationship between racial identity and psychological distress, particularly with respect to a group of high achieving young adults early in their medical careers. The findings also suggest that more work is needed to understand the socialization process of medical school and how it influences racial identity for African American students.

McNeil and colleagues argue that the medical student professional identity may be adopted as the central identity to the exclusion of other identities.[69] Intersectionality theory, a theoretical framework which take us beyond the dichotomous categorical understanding of a single social category, and towards an understanding of how interconnecting categories are experienced by individuals[70,71] must be used to explore whether or not this is indeed the case for African American medical students. This perspective recognizes the impossibility of separating social categories such as race, socioeconomic status, gender and professional identity (e.g. physician). Thus each identity, as a result of its intersection with another, comprises a mutually adapted system of social relations.[71] An understanding of how different social identities intersect and impact the identity formation of African American physicians is of crucial importance within medical education research and for the overall goal of diversifying the physician workforce.[71,72]

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Table 1

Summary of 2010 medical school matriculants by race

Percent of school 2010 matriculants that are:	N (schools)	Min (%)	Max (%)	Mean	Std. Dev
African American/Black	49	0.0	13.0	.06	.04
White	49	39.0	88.0	.65	.11

Table 2

Characteristics of the study sample

n=301	n (%)
Gender	
Female	198 (65.8)
Male	103 (34.2)
Born in USA	
Yes	222 (75)
No	76 (25)
Children	
Yes	19 (6.3)
No	281 (93.7)
Age	
18–24	104 (35)
25–35 or older	195 (65)
Relationship Status	
Not in a relationship	163 (54.2)
In a relationship	138 (46.0)
Family income	
Low-middle (\$10,000-\$74,999)	145 (52.0)
Upper-middle (\$75,000-\$249,999)	105 (37.6)
Upper (\$250,000-\$500,000)	29 (10.4)

Table 3

Mean scores for depression, anxiety and perceived stress by racial identity, gender and SES

Mean (SD)				
Racial Identity (RI)	Low RI	High RI	<i>p</i> value	
Depression symptoms ^a	50.0 (8.84)	54.0 (8.82)	.05	
Anxiety symptoms ^b	58.0 (8.52)	60.0 (8.54)	.001	
Perceived Stress	2.1 (.69)	3.0 (.63)	.05	
Gender	Male	Female		
Depression symptoms ^a	53.0 (9.83)	53.0 (8.61)	.37	
Anxiety symptoms ^b	59.0 (9.19)	59.0 (8.37)	.85	
Perceived Stress	2.6 (.72)	2.6 (.63)	.99	
SES (Family Income)	Low-middle	Upper-middle	Upper	
Depression symptoms ^a	53.0 (9.79)	51.0 (8.27)	50.64 (8.02)	.25
Anxiety symptoms ^b	59.0 (9.03)	58.0 (8.17)	57.0 (8.73)	.68
Perceived Stress	2.7 (.73)	2.6 (.68)	2.6 (.61)	.93

^a Normative T-scores are standardized with the mean set at 50^b Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Table 4**Poisson Regression of Racial Identity on Depression**

	Model 1		Model 2		Model 3		Model 4	
	RR ^a	95% CI	RR ^a	95% CI	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: High Racial Identity)	0.62 [*]	0.54 to 0.71	0.58 [*]	0.50 to 0.68	.60 [*]	.52 to .69	.62 [*]	.50 to .74
Gender (ref: Male)			0.79	0.82 to 0.72	.76	.71 to .82	.74	.68 to .80
SES (ref: Upper Income)								
Low-middle Income			4.04 [*]	1.48 to 11.03	4.01 [*]	1.47 to 10.95	4.14 [*]	1.01 to 10.01
Upper-middle Income			1.89	1.17 to 3.06	1.89	1.17 to 3.03	3.83	.980 to 15.00
Age					1.06	1.04 to 1.07	1.04	1.03 to 1.05
Relationship Status					.64	.56 to .73	.66	.58 to .74
Parental Status					1.27	1.09 to 1.49	1.27	1.09 to 1.48
Racial Identity X Family Income								
Low RI X Low-Middle Income							.18	.017 to 1.86
Low RI X Upper-Middle Income							.08	.001 to 3.86

Abbreviations: β , unstandardized coefficient; CI, confidence interval^{*} p<.05,^{**}

p<.01,

^{***}

p<.001

Estimates are weighted to account for probability of selection, stratification, and clustering

^aRelative risks were estimated through Poisson regression model with a log link function

Table 5

Poisson Regression of Racial Identity on Anxiety

	Model 1		Model 2		Model 3	
	RR ^a	95% CI	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: High Racial Identity)	0.88 *	0.84 to 0.99	.85 *	.80 to .95	.88 *	.84 to .93
Gender (ref: Male)			1.10	1.05 to 1.15	1.00	1.00 to 1.01
SES (ref: Upper Income)						
Low-middle Income			1.02	1.0 to 1.03	1.01	1.00 to 1.02
Upper-middle Income			.81	.67 to .96	.80	.67 to .83
Age					1.29	1.15 to 1.46
Relationship Status					.80	.72 to .89
Parental Status					1.27	1.09 to 1.49

Abbreviations: β, unstandardized coefficient; CI, confidence interval

* p<.05,

** p<.01,

*** p<.001

Estimates are weighted to account for probability of selection, stratification, and clustering

^aRelative risks were estimated through Poisson regression model with a log link function

Table 6

Poisson Regression of Racial Identity on Perceived Stress

	Model 1		Model 2		Model 3	
	RR ^a	95% CI	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: High Racial Identity)	.72 [*]	.61 to 1.15	.69 ^{**}	.45 to 1.07	1.22	.524 to .698
Gender (ref: Male)			0.98	0.82 to 2.72	.99	.79 to 1.82
SES (ref: Upper Income)						
Low-middle Income			1.07	.76 to 11.03	1.20	1.17 to 10.95
Upper-middle Income			1.09	.88 to 3.06	1.18	1.06 to 3.03
Age					1.00	.837 to 1.28
Relationship Status					1.00	.568 to 1.73
Parental Status						

Abbreviations: β , unstandardized coefficient; CI, confidence interval^{*} p<.05,^{**} p<.01,^{***} p<.001

Estimates are weighted to account for probability of selection, stratification, and clustering

^aRelative risks were estimated through Poisson regression model with a log link function