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Health Care Navigation of Black and White Adolescents After Sport-Related Concussion: A Path Toward Health Equity

Jessica Wallace, PhD, MPH, LAT, ATC*; Brian Q. Hou, BA†‡; Katherine Hajdu, BS†‡; Alan R. Tang, BA†‡; Alan Z. Grusky, BS†‡; Timothy Lee, MHA, ATC‡; Scott L. Zuckerman, MD, MPH‡§; Aaron M. Yengo-Kahn, MD‡§

*Athletic Training Program, Department of Health Science, University of Alabama, Tuscaloosa; †Vanderbilt University School of Medicine, Nashville, TN; ‡Vanderbilt Sport Concussion Center and §Department of Neurological Surgery, Vanderbilt University Medical Center, Nashville, TN

Context: Care-seeking behaviors for sport-related concussion (SRC) are not consistent across demographic subgroups. Not only may these differences stem from health inequities, but they can perpetuate disparities in care for SRCs.

Objective: To determine whether racial differences existed in the care pathway from injury to SRC clinic of adolescent athletes.

Design: Retrospective cohort study.

Setting: Regional SRC center.

Patients or Other Participants: Of 582 total athletes, 96 (16.5%) Black and 486 (83.5%) White adolescent athletes were diagnosed with SRC and evaluated within 3 months at the SRC clinic.

Main Outcome Measure(s): Race was the defined exposure, dichotomized as Black or White. The 4 primary outcomes were (1) location of the first health system contact, (2) time from injury to the first health system contact, (3) time to the in-person SRC clinic visit, and (4) whether the athlete established care (>1 visit), was released immediately to an athletic trainer, or was lost to follow-up.

Results: Black and White athletes mostly presented directly to the SRC clinic (61.5% versus 62.3%) at a median (interquartile range) of 3 (1–5) and 4 (1–8) days, respectively ($P = .821$). Similar proportions of Black and White athletes also first presented to the emergency department (30.2% and 27.2%) at a median of 0 (0–1) versus 0 (0–1) days, respectively ($P = .941$). Black athletes more frequently had care transferred to their athletic trainer than White athletes (39.6% versus 29.6%) and less frequently established care (56.3% versus 64.0%), respectively; however, these differences were not statistically significant ($P = .138$). Loss to follow-up was uncommon among Black (4.2%) and White (6.4%) athletes alike.

Conclusions: Within an established SRC referral network and multidisciplinary clinic, no racial disparities were observed in how athletes were initially managed or ultimately presented to the SRC clinic despite racial differences in school type and insurance coverage. The SRC center assimilation and affiliation with school systems may be helpful in improving access and providing equitable care across diverse patient demographics.

Key Words: health care disparities, care pathways, race, mild traumatic brain injury

Key Points

- Being within the sport-related concussion clinic referral network at the time of injury appeared to mitigate the effect of socioeconomic differences, promote health equity, and optimize continuity of care for Black and White athletes.
- Nearly two-thirds of Black and White athletes sought sport-related concussion care initially at the concussion clinic compared with the emergency department or other medical clinic.
- The presence of an athletic trainer was integral to the care pathway and may have helped to reduce disparities, as 40% and 30% of Black and White athletes, respectively, were released to the athletic trainer to carry out return-to-play protocols as the final sequence of care.

Sport-related concussions (SRCs) are a public health concern, particularly in the pediatric and adolescent populations. One in 5 adolescent athletes has reported sustaining a concussion in his or her lifetime.[1] These athletes often have diverse backgrounds with regard to characteristics including race, ethnicity, and socioeconomic status (SES). Diversity among adolescent athletes matters, as care-seeking behaviors for SRC are not consistent across demographic subgroups.[2–4] These differences stem from health inequities and can further perpetuate disparities in care for SRCs.

Race, operationalized as a social construct and determinant of health, is compounded by other social factors such as inequalities in health care, education, economic stability, community contexts, and neighborhood environments.[5] Previous authors[6] across medical fields and diagnoses indicated that even after accounting for factors including insurance, severity of disease, income status, and educational level, Black patients experienced worse outcomes and received lesser-quality care compared with their White counterparts. These findings suggest the pervasive effect of societal racial biases.[6] Structural racism contributes to segregation of resources, which may directly contribute to barriers to racial equality in the initial management of and access to care for SRC.[7]

Despite a general dearth of literature on the effect of race on pediatric SRCs, health disparities have been described in the evaluation and treatment of SRCs in Black and White athletes at the systemic and individual levels.[8] Notably, these disparities may reflect reduced access to athletic trainers (ATs),[9,10] fewer school- and community-based concussion resources,[9] or different social pressures. The culmination of these factors is a part of modern American medicine, with a history partly rooted in scientific racism.[11] Scientific racism in America has included virulent tactics of anti-Black racism or biology-based racism through the use of pseudoscientific and flawed methods to justify racial inequality.[12] Often, scientific racism led to structural racism in medicine that resulted in many Black patients receiving limited and unacceptable levels of medical care, with SRC care being no exception.[11] At the institutional level, athletes attending Title I schools—institutions receiving financial assistance because of a large enrollment of children from low-income families—reported less serious attitudes regarding concussions than those attending non–Title I schools; race had a strong association with reported attitudes.[13] Individually, Black high school athletes displayed poorer knowledge about concussion symptoms and were less likely to report concussions that occurred during games compared with White athletes.[8] Black children presenting to the emergency department (ED) with head trauma were less likely to be diagnosed with a concussion than non-Hispanic White children.[2,3,14] These diagnostic disparities can have downstream effects, such as the risk of cognitive impairment and more severe cognition-related symptoms, which have been previously described in Black versus White athletes.[15] These findings may be partially attributed to differences in access to care, as Black athletes were shown to be of disproportionately lower SES.[8]

Given these racial disparities in access to care, resources, and SRC knowledge and attitudes, further work is needed to consider the implications of race on the initial evaluation of patients with SRCs.[14] A comprehensive understanding of these racial differences may guide the development of appropriate protocols for ensuring optimal care across all racial and ethnic groups.[2] Moreover, differences in how athletes enter the SRC pathway represent modifiable targets for improving equity in SRC care, and learning more about their initial medical encounters may lead to better care and outcomes. Therefore, the purpose of our study was to compare the initial management, referral patterns, timelines, and final clinic disposition for Black and White athletes managed at a regional specialty SRC center. Based on the aforementioned studies suggesting the existence of racial differences pertaining to SRC, we hypothesized that initial management and care access would differ.

METHODS

Study Design and Patient Selection

We completed a retrospective cohort study using data from the Vanderbilt Sports Concussion Center (VSCC) registry. The institutional review board (No. 192033) determined the study to be exempt and waived the requirement for consent. Patients seen by VSCC providers between November 1, 2017, and October 1, 2020, for concussion were screened for eligibility (n = 1504). A concussion diagnosis was defined based on the International Classification of Diseases, 9th and 10th editions, codes for concussion (ie, 850.*, S06.0X**) and variants as well as postconcussion syndrome (eg, 310.2, F07.81). Patients aged 12 to 23 years were included in the registry if they had presented to a VSCC provider within 3 months of injury and the provider confirmed an SRC diagnosis based on the most recent Concussion in Sport Group guidelines.[16] Notably, those with acute intracranial findings (hemorrhage or fracture) on imaging were excluded (n = 8). In total, 868 (57.7%) met the criteria and were included in the registry. Given that our focus was on racial differences, those patients with missing or unknown race (n = 107) and those belonging to another minoritized racial group for which n < 20 (n = 23) were excluded. Additionally, only the first concussion of the study period was analyzed for any particular athlete to maintain independence of observations (n = 79 repeat concussions). Finally, we limited this study to middle and high school athletes, as the treatment pathway for collegiate athletes at the center was considerably different (n = 77). A patient-flow diagram detailing all exclusion criteria is provided in Figure 1.

A joint venture between Vanderbilt University Sports Medicine (VUSM) and the Vanderbilt Medical Center (VUMC) Neurosurgery and Orthopaedics Departments, the VSCC is a multidisciplinary center involving health care providers from a variety of specialties (neuropsychology, neurology, neurosurgery, pediatrics, sports medicine, emergency medicine, physical therapy, occupational therapy, speech therapy, and psychiatry). Vanderbilt University Sports Medicine provides athletic training outreach services to 26 high schools in the Nashville, Tennessee, area. Those schools are a mixture of city, county, and private schools. The ATs in the VUMC system are given direct access to all VSCC health care providers and services. The VSCC providers have also established relationships with ATs at high schools outside of the VUSM relationships. Referrals flow to the VSCC from the ED, ATs, and community providers. The VSCC provides baseline concussion testing and postinjury concussion management for patients with acute or complex SRCs.

Data Collection

We performed a manual chart review, extracting data from provider notes to a secure REDCap (Vanderbilt University) database. Loss of consciousness (LOC), amnesia, or both were noted as present if mentioned in the initial concussion visit note or on an athlete-completed intake form. *On-field evaluation* was defined by an explicit mention that the athlete was evaluated or not evaluated for a concussion at the time of injury. If there was no explicit mention, on-field evaluation was recorded as *unknown*.

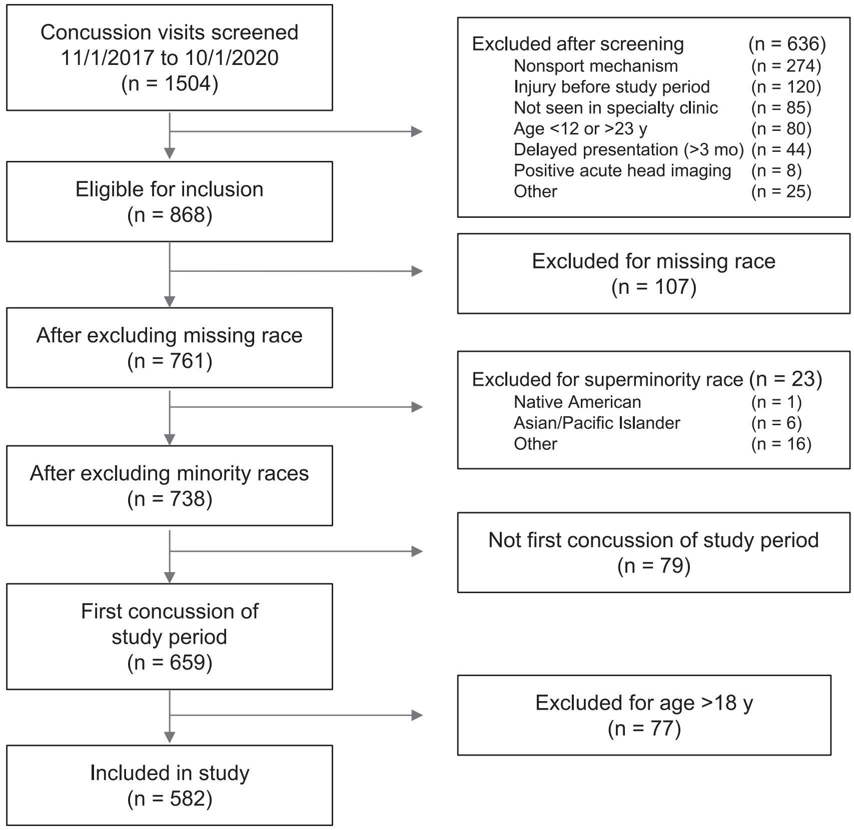

Figure 1. Patient inclusion and exclusion flow diagram.

Primary Outcomes

We used 4 primary outcomes: (1) time from injury to the first health system contact, (2) location of the first contact, (3) time to the SRC clinic visit, and (4) whether the athlete established care (>1 visit), was lost to follow-up, or was released immediately to an AT termed *disposition*. The *first health system contact* was defined as the location of the first non-AT health care provider seen after the injury (eg, ED or urgent care, SRC clinic, other clinic). The *SRC clinic* referred to any provider (ie, sports medicine, orthopaedics, neuropsychology) who saw patients under the VSCC umbrella. Those who first presented to either an in-system or outside ED, urgent care, or other walk-in clinic were coded as *ED/urgent care*. Those who presented first to general pediatrics, neurosurgery, or another scheduled clinic outside of VSCC were coded as *other*. We operationally defined *ED orders* as either a treatment (ie, medication, intravenous fluids) or diagnostic procedure (ie, imaging). The ED orders were recorded from provider notes, medication administration records, and outside medical records for those who first presented to ED/urgent care. The *time to first contact* was defined as the number of days from injury to the first health care provider contact, not including on-field evaluations. The *time to the clinic visit* was defined as the days from injury to presentation at VSCC. The *time to the first VSCC follow-up* was defined as the number of days from the first VSCC visit to the second VSCC visit and was calculated only for those who had follow-up. Disposition of the athlete after the first VSCC visit was coded as *established care* (ie, >1 follow-up visit at VSCC), *lost to follow-up*, or *released to AT*. *Lost to follow-up* was defined as the follow-up being requested but not completed. If the VSCC provider indicated that the athlete was being released to the school-based AT for further monitoring and a protocol for the return to activity, then that athlete was considered *released to the AT*.

Statistical Analysis

The data were grouped by race, Black or White, as a dichotomous variable. Race was self-reported by the patient on intake forms. Descriptive analyses were performed with categorical data reported as frequencies and proportions. Continuous data except for age were presented as the median and interquartile range, given the nonnormal distribution. Age was presented as the mean $\pm$ SD. Group comparisons were conducted using χ^2 statistics, Mann-Whitney U, or independent-samples t tests, as appropriate. Statistical significance was set a priori at $P < .05$.

RESULTS

Patient Demographic Data

The final cohort consisted of 582 athletes, of whom 16.5% were Black (n = 96) and 83.5% were White (n = 486). Full demographic and past medical history data are presented in Table 1. No racial differences in patient age were present ($t_{1,580} = 1.286$, $P = .199$). More White athletes attended private schools (24.0%) compared with their Black counterparts (9.5%, $P = .002$), and more White athletes than Black athletes were privately insured (86.0% versus 71.9%, $P = .003$). Race was associated with concussion history ($P = .013$): White athletes more frequently reported

Table 1. Demographics and Medical History

Characteristic	Participants: Black (n = 96, 16.5%)	Participants: White (n = 486, 83.5%)	*P* Value[a]
Demographics			
Age, mean ± SD, y	15.85 ± 1.34	15.64 ± 1.46	.199
Sex, No. (%) male	68 (70.8)	302 (62.1)	.106
Ethnicity, No. (%)			.420
Hispanic	1 (1.0)	17 (3.5)	
Non-Hispanic	79 (82.3)	383 (78.8)	
Unknown	16 (16.7)	86 (17.7)	
School type, No. (%)			**.002**
Private	9 (9.4)	112 (23.0)	
Public	59 (61.5)	201 (41.4)	
Unknown	28 (29.2)	173 (35.6)	
Insurance type, No. (%)			**.003**
Private	69 (71.9)	417 (85.8)	
Medicaid	21 (21.9)	43 (8.9)	
Unknown or other	6 (6.3)	25 (5.2)	
Medical history, No. (%)			
Prior concussion(s)			**.013**
0	78 (81.3)	320 (66.7)	
1	14 (14.6)	104 (21.7)	
2+	4 (4.2)	56 (11.7)	
Attention-deficit hyperactivity disorder	13 (13.5)	55 (11.4)	.545
Learning disability	6 (6.3)	14 (2.9)	.100
Migraine	8 (8.3)	52 (10.7)	.479
Family history of migraine	22 (22.9)	131 (27.1)	.399
Psychiatric history[b]	9 (9.4)	52 (10.8)	.681
Family history of psychiatric disorder	6 (6.3)	60 (12.4)	.082

[a] Differences are indicated in bold type.
[b] Includes depression, anxiety, bipolar disorder, and variants.

Table 2. Initial Concussion Characteristics and Management

Item	Participants: Black (n = 96)	Participants: White (n = 486)	*P* Value[a]
On-field characteristics, No. (%)			
Loss of consciousness	21 (21.9)	57 (11.8)	**.008**
Amnesia	14 (14.6)	94 (19.3)	.273
Evaluated on the field	38 (39.6)	140 (28.8)	.099
Unknown	25 (26.0)	162 (33.3)	
Management characteristics			
Time to first contact, median (IQR), d	2 (0–4)	2 (0–5)	.595
First health system contact, No. (%)			.723
Emergency department or urgent care	29 (30.2)	132 (27.2)	
Concussion clinic	59 (61.5)	303 (62.3)	
Other clinic[b]	8 (8.3)	51 (10.5)	
Emergency department treatments, No. (%)[c]			
Imaging	11 (37.9)	67 (50.8)	.211
Pain medication	7 (24.1)	39 (29.5)	.559
Zofran (GlaxoSmithKline)	0 (0.0)	13 (9.1)	.128
Intravenous fluid	2 (6.9)	16 (12.1)	.533
Laboratory work	3 (6.1)	8 (6.1)	.419
Hospital admission	1 (3.4)	7 (5.3)	1.000
Time to concussion clinic visit, median (IQR), d	4 (2.5–7.5)	5 (2.0–12.0)	.704
Disposition after concussion clinic, No. (%)			.138
Lost to follow-up	4 (4.2)	31 (6.4)	
Released to athletic trainer	38 (39.6)	144 (29.6)	
Established care	54 (56.3)	311 (64.0)	
Time to first concussion clinic follow-up, median (IQR), d	13 (7–21)	13 (7–20)	.558

Abbreviation: IQR, interquartile range.
[a] Differences are indicated in bold type.
[b] Other clinics: general pediatrics, neurosurgery, ophthalmology.
[c] Recorded only for those who first presented to the emergency department (Black = 29, White = 132).

≥1 prior concussion (45.0% versus 22.9%). The 2 groups were otherwise similar in terms of past medical and family histories.

Injury Characteristics and Initial Management

Black athletes more frequently reported LOC than White athletes (21.9% versus 11.8%, $P = .008$), whereas amnesia (retrograde and anterograde) was reported similarly by the 2 groups (14.6% versus 19.3%, respectively, $P = .273$). The health care navigation pathways of the 2 groups of athletes are presented diagrammatically in Figure 2. Black and White athletes demonstrated no difference in the prevalence of on-field evaluation (39.6% versus 28.8%, $P = .099$) postinjury or time to the first health system contact ($U = 22\,209.50$, $P = .595$; Table 2). The type of initial health system contact setting was not dependent on race ($P = .723$). Most Black and White athletes sought care initially in the concussion clinic (61.5% versus 62.3%, $P = .723$), followed by the ED/urgent care (30.2% versus 27.2%, $P = .723$).

Overall, Black athletes reporting to the ED received similar ED orders as their White counterparts. Looking at the breakdown of individual ED orders, 50.8% of White athletes received diagnostic head imaging compared with 37.9% of Black athletes, but this was not statistically significant ($P = .211$). Also, ED orders that included pain or nausea medication administration did not differ ($P = .559$ and $P = .128$, respectively). Furthermore, the rates of hospital admission between the groups were not different ($P = 1.000$). In summary, of those who initially presented to the ED, 66.7% of White athletes received 1 or more ED orders, compared with 55.2% of Black athletes ($P = .241$); 25.7% of White athletes and 13.8% of Black athletes received at least 2 ED orders ($P = .169$).

Follow-up SRC Management

Both Black (median = 4 days; interquartile range = 2.5–7.5 days) and White (median = 5 days; interquartile range = 2.0–12.0 days) athletes presented to the concussion clinic within similar time frames ($U = 22\,757.50$, $P = .704$; Table 2). After the initial evaluation in the concussion clinic, Black and White athletes demonstrated similar dispositions ($P = .138$), with low rates of loss to follow-up (4.2% versus 6.4%), and the majority established care (56.3% versus 64.0%). For those who established care, follow-up occurred at a median of 13 days for both Black and White athletes ($U = 8565.50$, $P = .0558$).

DISCUSSION

Health care disparities often emerge through the interactions among race, SES, and access to care. Thus,

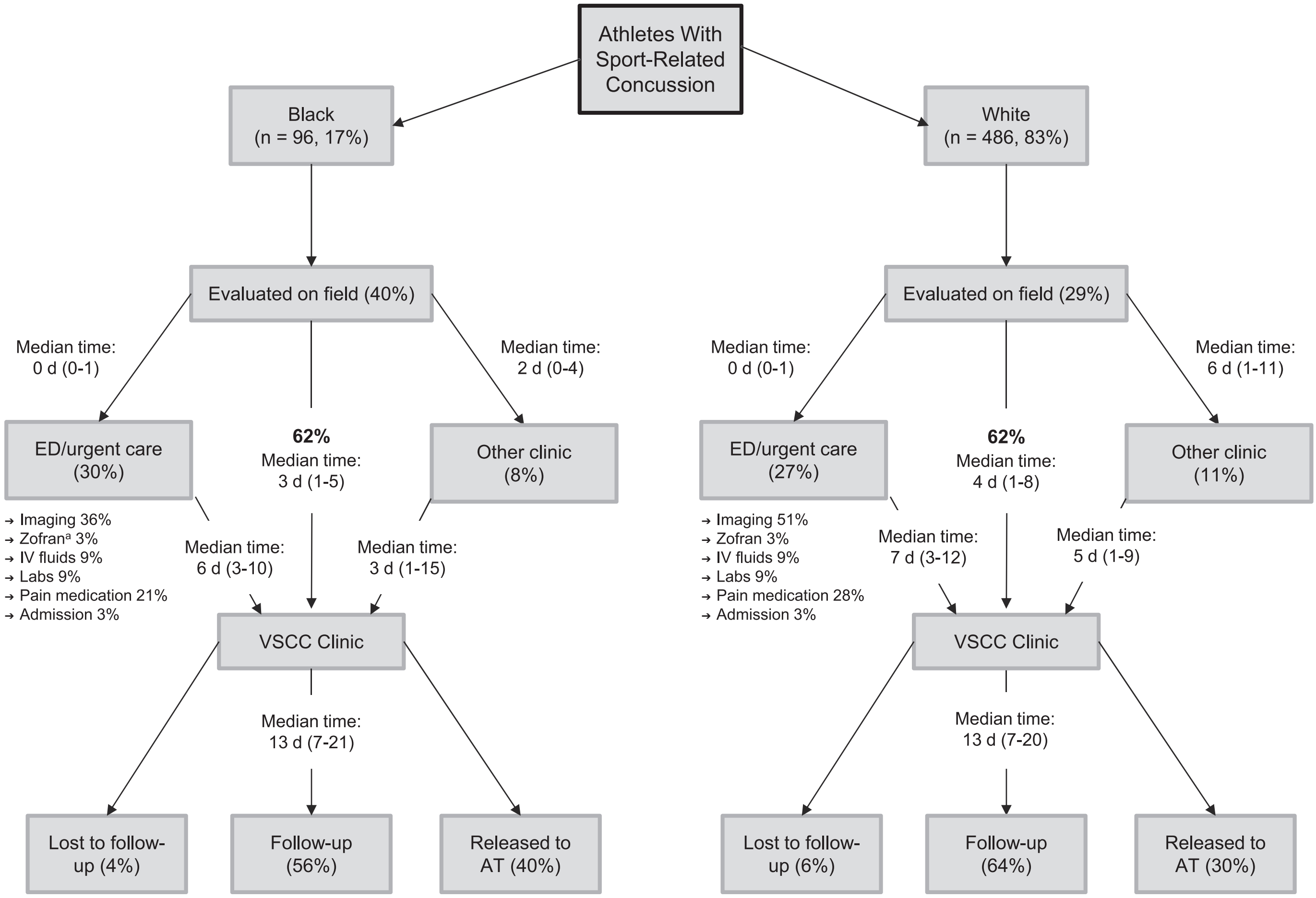

Figure 2. Health care navigation pathways for Black and White athletes. Abbreviations: AT, athletic trainer; ED, emergency department; IV, intravenous; VSCC, Vanderbilt Sports Concussion Center. [a] GlaxoSmithKline.

disentangling these factors can be challenging, and without data that include minoritized groups, the scientific, scholarly, and clinical communities cannot actively advance equitable health policy or health care. In an effort to contextualize racial disparities in SRC management, we compared initial care, referral pathways, and timelines for SRC management in Black and White adolescent athletes within a regional health care network. Nearly two-thirds of Black and White athletes sought SRC care initially at the concussion clinic versus the ED or other medical clinic. However, of those who first went to the ED, a greater proportion of White athletes received 1 or more ED orders compared with Black athletes (67% versus 55%). Moreover, 26% of White athletes received at least 2 ED orders compared with only 14% of Black athletes. Otherwise, referral patterns and care timelines did not differ between Black and White athletes. A minimal percentage of patients was lost to follow-up, and no differences were observed by race. These findings suggest that racial disparities may be appropriately minimized within an established regional SRC care network by facilitating health care navigation.

Contextualizing the importance of understanding race within a framework of health equity addresses key social concerns in the process of reducing US health disparities. The health care infrastructure that includes the organization, financing, and availability of services has historically been unequal between the Black and White communities.[17] Before the 1964 Civil Rights Act, Black and White people were mandated by national law to seek care in separate facilities or on separate floors within a facility.[17,18] Consequently, health inequity and inequality resulting from structural racism have produced unequal access to medical care, provider-level challenges and disparities, and disparities in health outcomes.[11,17,18] Greater perceived racial discrimination has also been associated with delayed care seeking among Black individuals.[7,17] Within our sample, a notable disparity was that fewer Black athletes had private insurance compared with White athletes. Previous analyses have shown that individuals with public insurance, or particularly a lack of private insurance, were less likely to seek care in a tertiary specialty concussion clinic[19] and more likely to initiate point of entry at the ED[4] or present >14 days postinjury.[20] These disparities may be related to barriers in the referral process or providers not participating in Medicaid. Notably, despite insurance differences between Black and White athletes in this study, we saw no differences between groups in the direct care path to the SRC clinic or in loss to follow-up. Although we hypothesized that anticipated racial differences in insurance status might result in differences in access or delays in care, we found that being within the SRC clinic referral network at the time of injury appeared to mitigate the effect of socioeconomic differences, promote health equity, and optimize continuity of care. Possible reasons for accepting the null hypothesis may be that adolescent athletes have better access to health care because of the scholastic-sponsored nature of their injury, whereas individuals playing in non–school-sanctioned sports may have a harder time establishing care.

The ED is frequently the first health system contact, and ED use for SRC can lead to unnecessary imaging, inefficient patient handoffs, or fragmented care.[21] Emergency department physicians were marginally aware of concussion consensus statement recommendations and return-to-play protocols,[22] which can interfere with care trajectories and timelines for recovery. In our study, ED use for SRC was similar by race. An explanation could be the presence of ATs within the concussion center network who recognize on-field symptoms or diagnose concussions and assist with referrals directly to the concussion clinic. However, these results contrast somewhat with the previous literature,[2,3] which illustrated that Black children and adolescents seeking care at the ED after a head injury were less likely to be diagnosed with a concussion than their White counterparts. Notably, though, these prior findings are not incompatible with ours, as Black patients who were seen and discharged without a concussion diagnosis would not have been included in the present study. Yet we may expect some portion of these patients who were not initially diagnosed to later present in delayed fashion,[23] though we found no evidence of this phenomenon (ie, longer times to clinic). Seeking initial care at the ED could be a symptom of not having a primary care relationship or could be related to those who experienced LOC or persistent or delayed nausea and vomiting, as those patients are more likely to recognize their injury as a concussion and present to the ED.[24] More than 20% of Black athletes and nearly 12% of White athletes experienced LOC, values that are inflated compared with previously published estimates.[16] These specific symptoms may have increased the rate of appropriately diagnosing SRC, whereas those with mild symptoms may have been discharged without a diagnosis or diagnosed and not referred to the concussion center. Given the sampling methods, we cannot exclude the possibility that Black athletes without LOC were disproportionately discharged without a diagnosis of SRC after head injury, which would explain the racial differences in LOC. Unfortunately, aside from LOC, whether the athletes may have experienced any other on-field symptoms, leading to either a referral to the ED or a family decision to seek care at the ED, is unknown.

Despite similarities in presentation to the ED between Black and White athletes, inconsistent diagnostic procedures and treatments provided to Black and White athletes raise questions and suggest room for improvement in providing equitable care. Fifty percent of Black athletes who sought care at the ED were sent home without a single ED order. In contrast, White athletes received more ED orders overall, including head imaging, pain medication, nausea medication, and intravenous fluids. For example, over 50% of White athletes who sought care at the ED received imaging, compared with 36% of Black athletes. Although these measures were not statistically significant, we believe the raw data are a more robust and transparent indicator of health equity. This difference in imaging as a diagnostic procedure also aligns with previous cross-sectional research[25] using nationally representative data with nonhospitalized patients from 52 tertiary children's hospitals. Imaging was performed during 33.5% of ED visits by White patients in contrast to 24.1% of Black patients. Despite stratification by insurance status, Black patients were 31% less likely to receive diagnostic imaging as part of their ED evaluation compared with White patients.[25] Although these findings suggest that race may be independently associated with imaging decisions in the ED, more research using nationally representative ED data is needed to understand the imaging and other services provided specifically for patients with concussion.

Racial disparities have been documented along the spectrum of clinical care; however, representation of Black people or other minoritized groups is often missing in published SRC studies, making this factor difficult to discern. Although previous investigators demonstrated disparities in access to ATs,[10] accessible baseline neurocognitive testing,[26] use of subspecialty concussion care,[19] and concussion symptom knowledge,[9] understanding care paths among groups can help to answer questions regarding recovery timelines and treatment pathways. Bretzin et al[27] showed that the median time to medical clearance after an SRC varied by health care provider and medical facility. These results did not address racial diversity, but those who sought initial care at the ED or urgent care facility were cleared sooner than those who sought initial care with a team physician or specialist.[27] Our outcomes illustrated that timelines and pathways to care were similar between Black and White athletes for on-field evaluation, time to the first health system contact, time to the concussion clinic visit, and time to the first follow-up visit. On-field evaluation is most often conducted by an AT, and earlier authors[27] showed that an AT was one of the initial examiners in 72% of SRC cases across a large statewide epidemiologic study. The presence of an AT may promote direct referrals and allow for more proximal SRC services (ie, at the athlete's school rather than requiring travel to a clinic for follow-up), thereby helping to reduce disparities. Moreover, 40% and 30% of Black and White athletes, respectively, were released to the AT to carry out return-to-play protocols as a final sequence of care.

The limitations of this study warrant discussion. First, these results are bound by disproportionate numbers of Black and White athletes that reflect regional demographics; beyond attendance at a private or public school, the patients' school-based demographics are unknown. These demographics could include the degree of AT access (eg, full- or part-time staffing) and SES of the school population. Second, this study was limited to patients who received care at our SRC clinic. Thus, it may not have fully captured all patients who sustained an SRC and either did not present at all or presented only to an outside provider, AT, or outside ED. Therefore, we are unable to comment on whether diagnosis and access to care were equitably distributed in the community at large other than to note that patients who were seen followed similar referral patterns, timelines, and dispositions. Specifically, disparate care paths and health care use for mild traumatic brain injury have been exacerbated by geographic disparities for patients in rural locations,[28] who may not have been included in this analysis. Similarly, we do not know the full community or neighborhood characteristics for the patients, which may explain variations in health system navigation better than race alone. Moreover, these data were limited to a single regional health care system, and the results may not be generalizable to other US health care systems. Future researchers would benefit from expanding care-path patterns to communities or geographic regions not well represented in this study to better understand care paths and timing-related outcomes related to care seeking. However, these results can serve as a care-path example to networks looking to expand in order to provide more equitable care. Finally, not all SRC guidelines advocate sending individuals with SRC to a specialty center such as the one in this study; however, previous literature[29,30] suggested that a concussion center visit within the first week postinjury improved the odds of a more rapid recovery. Thus, a multidisciplinary network that includes ATs and ED physicians who can make a quick referral to the SRC clinic for patients with uncomplicated SRC can equitably expedite care and recovery.

CONCLUSIONS

Equitable SRC care is possible when similar resources are provided to diverse communities. With established relationships that include a network of schools, ATs, and a concussion clinic, it can be easier for patients to navigate medical spaces and be provided a path to care and treatment for SRC. The direct field-to-clinic care path was responsible for 62% of SRC patients in our regional SRC center over 3 years. Despite school type and insurance differences between Black and White athletes, no significant racial disparities were apparent in the time from injury to the first health system contact, location of the first contact, time to the SRC clinic visit, and whether the athlete established care (>1 visit), was released immediately to an AT, or was lost to follow-up. Furthermore, although this finding was not statistically significant, Black athletes received fewer ED orders compared with White athletes. Our care-path results offer a health-equity–focused example of a health care network model that can reduce disparities and facilitate the continuity of care for SRC. A care path can optimize resource use, value-based care, interdisciplinary communication, and equitable outcomes. However, we are mindful that these outcomes reflected only patients who sought care at the SRC center and did not capture the care paths of patients who did not receive care, nor did they address possible disparities in access or care for those who never presented to the health system.

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Address correspondence to Aaron M. Yengo-Kahn, MD, Department of Neurological Surgery, Vanderbilt University Medical Center, Medical Center North T-4224, Nashville, TN 37212. Address email to a.yengo@vumc.org.