ELSEVIER

Does the African-American–White Mortality Gap Persist After Playing Professional Basketball? A 59-Year Historical Cohort Study

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PURPOSE: The African-American–white mortality gap for males in the United States is 6 years in favor of whites. Participation in professional sport may moderate this ethnic disparity. The historical cohort of professional basketball players, with nearly equal numbers of African-American and white players, can provide a natural experiment that may control for the classic confounders of income, education, socioeconomic status (SES), and physical factors related to mortality. The objectives of this study are to assess mortality and calculate survival for the overall study population and within ethnicity.
METHODS: Data were combined from several publicly available sources. The cohort was analyzed to compare longevity among all players, and for players stratified by ethnicity, with the general U.S. population.
RESULTS: The final dataset included 3366 individuals, of whom 56.0% were African American. Results suggest white players live 18 months longer than their African-American colleagues. African-American players gained 9 years on their respective referent and live longer than white men in the general public. After controlling for covariates, we found that African-American players have a 75% increased risk of death compared with white players, a statistically significant gap ($p < .0001$, 95% confidence interval 1.41–2.44).
CONCLUSIONS: The African-American–white mortality gap for males is largely ameliorated (1.5 years vs. 6.1 years) in professional basketball but still persists.
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KEY WORDS: Health Disparities, Ethnicity, Epidemiology, Basketball.

INTRODUCTION

The life expectancy of African Americans is lower than that of white Americans (1). African-American men have the greatest death rate of all ethnic groups, male or female (2), with the African-American–white mortality gap in men currently at 6.1 years (3). Despite overall improvements in longevity in the 20th century, the African-American–white male mortality gap remains (4) and has actually worsened for African-American men age 35 and older (5). Reasons for this discrepancy are manifold but include income, education, access to health care, and socioeconomic status (SES). SES is a complex construct that includes income, education, occupation, and access to resources such as better housing and diet, political power, health care, and health insurance. SES predicts variation in health and accounts for much of the African-American–white differences in health (6). Regardless of education level, African-American men tend to earn less than white men (2). In 2000, African-American men of the general population earned on average only 78% of white men's earnings (5).

Comparing mortality and survival within a single occupation may help overcome potential confounders such as income, intelligence, and physical condition. To date, in very few epidemiological studies have investigators examined mortality differences among ethnicities within the same occupation. Howard and Holman (7) examined the ethnic impact on diseases in the US for 22 different occupational categories. For every category, whites had a lower mortality ratio; all ethnic comparisons were statistically significant. For the "all occupations" comparison, African Americans had a mortality risk approximately twice that of whites. When SES was considered, African Americans in the lowest class had twice the risk of whites of the same class. However, in the highest class, there was only a 20% increased risk for African Americans (7). In a 2000 study of male physicians (8), whites were found to live 4.3 years longer than their African-American colleagues, a significant result.

Participation in a professional sport might illuminate the ethnic mortality disparities extant in the United States. In the present investigation we examined mortality and survival in the context of a profession that requires a high

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Selected Abbreviations and Acronyms

CDC = U.S. Centers for Disease Control and Prevention
CI = confidence interval
NBA = National Basketball Association
SES = socioeconomic status

level of physical fitness and enables employees to earn substantial compensation for a period of time. African-American professional basketball players are likely less susceptible, in large part, to the problems faced by the general African-American population because in basketball no wage discrimination has been found on the basis of ethnicity and all participating individuals earn substantially more than the general public (9–12). Educational achievement is also more comparable for the two racial groups of National Basketball Association (NBA) players than the general population. The graduation rates for all African-American collegiate basketball players are 18% greater than for African-American nonathlete students (13), although the current NBA rules require only that talented younger players to participate in at least 1 year of collegiate basketball before being qualified to enter the NBA. The historical cohort of American professional basketball players, with nearly equal numbers of African-American players and white players, provides a natural experiment that may control for classic confounders of education, income, and other components of SES in studies that compare outcomes among ethnic groups.

METHODS

The historical cohort is defined as participants in American professional basketball between November 1, 1946 and July 1, 2005. Although professional basketball's roots date back to 1898, the sentinel event for this study is the establishment of the Basketball Association of America in 1946. This league was renamed the National Basketball Association (NBA) in 1949 and remains so today. The NBA subsumed the American Basketball Association in 1975. All participants in each of these three leagues were considered eligible for inclusion in this study. The referent data for the general population for July 1, 2005 were obtained from the U.S. Centers for Disease Control and Prevention (CDC) in the form of life tables for all males and for each ethnicity (3). At the initiation of the study, these data were the most recent available for the referent population. For this reason the last NBA season considered is the 2004 to 2005 season.

No dataset suitable to explore these professional athletes' longevity and possible associated variables was known to exist; therefore, one was compiled from several sources. Two primary sources were queried, www.basketball-reference.com (14) and www.apbr.org (15) (The Association for Professional Basketball Research). These two sites provide details of participants in each team during each basketball season, including both demographic and physical variables. Neither of these sites claims to be a definitive source of information; however, they have been used in multiple academic studies (16–25). Information from these sites was used to define the study population and determine the ethnicity, height, weight (from early in the players' careers), body mass index, dates of birth and death, and duration of the professional basketball career of each participant. On rare occasions, the demographic data that were missing from the two basketball sources were found by a Google web search of the individual in question. Data were only included from websites with complete data and face validity. Fewer than 10 of the missing ethnicities were determined from pictures included in articles.

To determine mortality status and date of death, the details of each player were ascertained from web-based resources including the two aforementioned basketball sites (26). A Google search with the player's name and the additional search term of "NBA" was used as a third source and death was inferred if the player's death was noted in the first two pages of results. The fourth source of mortality information was the Social Security Death Index. Death status was adjudged by a credible, affirmative report from any one of the four sources. Deaths were current as of December 31, 2011. Age at death, where applicable, was calculated from each individual's dates of birth and death.

Originally there were 3911 individuals in the dataset. Players who did not appear in at least five games were excluded as trial recruitment is commonplace (the minimum NBA contract length is 10 days) and such individuals may play for mere minutes in their entire professional career. There were also instances of players who played in only one game as publicity stunts to boost ticket sales. The application of this exclusion criterion ensures that nearly all of the individuals in the dataset were on a roster for at least one season. A small proportion of players were of foreign birth ($<5\%$). Four Asian players were omitted from the survival analyses.

Life tables were created to compare survival times for by ethnicity and used to derive actuarially adjusted survival curves and life expectancies. Wilcoxon nonparametric tests were used to assess whether curves had significantly different distributions. Kaplan-Meier analyses were performed to estimate crude survival ages for each ethnic group. Cox proportional hazards survival analysis was used to ascertain whether differences in survival by ethnicity were significant by adjusting for height, weight, and playing era. Mean weight and height increased during the course of the study; therefore, these were entered in the models separately rather than using body mass index.