COVID-19 Awareness Variance
Among Black Americans and Healthcare Workers

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Abstract

Background: This study examines differences in COVID-19 awareness among Black Americans versus those of other races as well as healthcare workers versus non-healthcare workers. COVID-19 awareness is also assessed based on sociodemographic factors including gender, age, level of education and social standing.
Methods: Data from a cross sectional online survey sent out by Pennsylvania State University's College of Medicine was utilized. The sample of American adults (n=1583, Black=76, non-Black=1507, mean age= 48.2) responses to 7 true/false COVID-19 knowledge questions and self-report demographic information was analyzed.
Results: Lower levels of COVID-19 awareness and social standing were observed in Black Americans compared to those of other races, even after adjusting for other demographic information. Higher perceived social standing and higher levels of education were also uniquely associated with higher levels of COVID-19 awareness. Healthcare workers also tended to have higher levels of COVID-19 awareness regardless of professional role.
Conclusions: Based on these results, there are disparities in health awareness, which can influence health behaviors and status. More research is needed to determine causes (e.g., access to health information resources) and address gaps in public health messages.

Introduction

The COVID-19 pandemic has further amplified health inequities within the Black population in the United States. Systematic racism has resulted in decreased access to quality healthcare, lower socioeconomic status, increased risk for chronic diseases and lower quality of education in Black communities (Perry et al., 2020; DiMaggio et al., 2020). These factors pose a disproportionate risk for COVID-19 infection and death for African Americans. Studies on the COVID-19 data have reinforced this inequity as African Americans are at a 5 times greater risk of contracting COVID-19 and also have higher death rates at 40% while African Americans make up 14% of the population (Souza et al., 2020; DiMaggio et al., 2020). Thus, the purpose of the study is to examine the relationship between Black race and the amount of COVID-19 awareness.

Previous studies have found a causal relationship between level of health literacy and health behaviors in patients with Diabetes, as well as other chronic diseases (Kim et al., 2010; Chollou et al., 2020). Based on this, an individual's education level may play a factor in the amount health knowledge and the precautions engaged in during the COVID-19 pandemic, such as social distancing and wearing a mask. There is also evidence of poor quality of education within public school systems in predominantly Black areas, exemplified by achievement gaps reflected in data reported by the U.S. Department of Education (Brey et al., 2019). This may contribute to the comprehension of medical jargon surrounded COVID-19 and understanding how to navigate health services (Brey et al., 2019). However, limited literature has explored racial differences in COVID-19 awareness, which could be useful in understanding racial disparities in COVID-19 cases and deaths.

Prior health disparities literature has indicated that race does not entirely explain disproportionate rates of adverse health outcomes, such COVID-19 deaths (Khariton et. al., 2018). Sociodemographic factors such as social standing, age, gender, and type of employment (e.g., medical/health occupation) have also accounted for health disparities (Ezeamama et al., 2016; Roberts et al., 2021). For example, previous studies have found that higher perceived social standing is associated with better health outcomes in HIV patients (Ezeamama et al., 2016). In addition, minorities have also been found to have more chronic conditions and behavioral risk factors in Prostate Cancer survivors (Roberts et al., 2021). With social status implicating health status, it can also be hypothesized that employment within the medical field may play a pertinent role in accessing health information (Hossain et al., 2021), which may not be readily communicated in the public section. For example, high levels of knowledge have been reported in Healthcare workers (Hossain et al., 2021). Furthermore, levels of health literacy/awareness may also vary depending on the role within the medical field, such as Physicians or Nurses. Currently, Black Americans account for 11.6% of the US Workforce, while only representing 5.7% of Advanced Practice Nurses and 4.8% of Physicians (US Department of Health and Human Services, 2011-2015). However, there is greater representation of Black Americans in Technologist/Technician roles and support roles (e.g., Home Health, Nursing Aides, and Medical Assistants), which tend to have lower salaries (US Department of Health and Human Services, 2011-2015). Thus, the association between sociodemographic factors (e.g., race and socioeconomics) and health literacy awareness may vary by medical employment status. By examining the knowledge levels of Black Americans and other sociodemographic factors on COVID-19 protocols, this association between health literacy and behaviors may also address some of the disparities in health promotion campaigns.

Thus, the current study will explore the following aims. The first aim will examine whether awareness of COVID-19 varies between Black adults and adults of other races. The second aim will examine how demographic factors (age, level of education, perception of social standing, race) relate to COVID-19 awareness. The third aim will examine the relationship between COVID-19 Awareness and healthcare employment and whether this association varies by demographic factors (race, levels of education, and social standing).

Methods

Participants

The data used for this research was collected from a cross-sectional online survey that occurred from April 9 to July 12, 2020. A total of 5,005 people completed the survey. Participants were recruited through snowball sampling. Snowball sampling is a recruitment process that used press releases from Penn State University College of Medicine and shareable social media links.

Measures and Procedures

This survey was adapted from another survey in partnership with the College of Healthcare Information and Management Executives (CHIME). To assess COVID-19 knowledge, responses to the 7 true/false questions about social distancing and COVID transmission will be analyzed in terms of sum of correct responses. Social standing was assessed from the responses to the MacArthur Scale of Subjective Social Status. This scale asks participants to rate their social status from 0 (low) -10 (high). Demographic data, such as race, gender, age, and levels of education (0 (did not finish high school/secondary school) – 5 (graduate degree)) were gathered through self-report from participants.

Statistical Analyses

For the research methods, a statistical analysis of data from a cross-sectional survey will be conducted using SPSS. An ANOVA or t-test will be used to assess for differences in knowledge by race. In order to examine the influence of demographic factors, correlation between these factors and COVID-19 awareness will then be computed. A regression model will then be utilized to determine the relationship of age, social standing and race on COVID-19 knowledge. Correlation and a regression model will also be computed to determine the relationship between employment in healthcare and COVID-awareness. This will also be analyzed to identify how race, age and social standing interact with this relationship. For the final research question, a regression model was conducted and included interaction terms (e.g., medical profession*Black race; medical profession*levels of education; medical profession*social standing) to explore whether the association between medical profession status and COVID-19 awareness varied by demographic factors.

Results

The current study included 1,583 participants with complete data across the measures of interest. The total sample had a mean age of 48.2 years (SD=15.67, range=18-97; see Table 1 for demographic characteristics of the sample). A majority (n=1178; 74.4%) of the participants were female. The participants' average social standing was 7.07 (SD=1.55), which suggests a relatively high perceptions of social standing. Approximately, 20.3% (n = 322) reported working in a medical profession (Nurses n = 43, Physicians n = 59, Nurse Practitioners n = 12, Physician Assistants n = 4, Administration n = 36, other clinical staff= 64 or non-clinical staff n = 43). Significant racial differences were observed strictly for age and social standing (see Table 1). Specifically, non-Black participants reported being an average of 48.2 years as compared to 39.19 years for Black participants (t(1535) = 5.15, p < .001). Perceived social standing was also significantly lower for Black participants with scores averaging 6.37 (1.84) as compared to 7.11

(1.52) for non-Black participants (t(1523)= 4.06, p < .001). There was not a significant difference in level of education or gender between Black and non-Black participants.

COVID-19 Awareness Survey Descriptive Observations

On average, the sum of correct responses on the COVID-19 awareness survey was 4.24 (*SD*=1.16, range=0-6; see Table 2). Significant racial differences were also observed for the sum of correct responses on the COVID-19 awareness survey (Table 2). Black participants had an average score of 3.74 (SD=1.49) while non-black participants had a mean score of 4.27 (SD=1.13; t(1581)= 3.90, p < .001), which suggests knowledge gaps about COVID-19 between Black adults and other racial/ethnic groups. To delve further into possible reasons for this significantly lower score, frequencies of participants who reported correct responses to each question was estimated by racial groups (Black vs. Non-Black participants). Out of the 7 questions, 2 questions indicated significant racial group differences (Table 2). Specifically, a lower percentage of Black adults (61.9%, n = 47) reported correct responses to Item 3, "A vaccine for COVID-19 is available in some countries", compared to non-Black adults (80.0%, n = 1206; X^2(1) = 14.5, p < .001). Additionally, a lower percentage of Black adults (77.6%, n=59) reported correct responses to Item 7, "Most people who get COVID-19 will survive", compared to non-Black adults (91.6%, n = 1385; X^2(1) = 18.4, p < .001).

Significant differences in correct responses on the COVID-19 awareness survey were also observed between healthcare workers (employed in a medical profession) and non-healthcare workers (employed in non-medical profession; see Table 3). On average, healthcare workers (*M* = 4.43, *SD* =1.08) tended to have more correct responses than non-healthcare workers (*M* = 4.21, *SD* =1.14; t(1581)= 3.904 p < 0.001). Significant differences in terms of correct responses were observed between healthcare professionals and non-health professionals for 2 out of the 7 survey question items. Specifically, a larger percentage of healthcare workers (43.5%, n = 140) reported correct responses to Item 4, "The World Health Organization, European Commission, and U.S. Centers for Disease Control and Prevention all have the same public health recommendations to reduce the spread of COVID-19", compared to non-healthcare workers (33.4%, n = 405; X^2(1) = 11.31, p < 0.001). Likewise, a larger percentage of healthcare workers (57.1%, n = 184) reported correct responses Item 5, "Treatments for mild symptoms of COVID-19 are available without a prescription", compared to non-healthcare workers (47.5%, n = 576; X^2(1) = 9.49, p=0.002). While significant differences were observed between healthcare workers and non-healthcare workers, there was no significant differences on the COVID-19 awareness survey across medical professional roles (Nurses, Physicians, Nurse Practitioners, Physician Assistants, Administration, or non-clinical staff).

Demographic Characteristics associated with COVID-19 Awareness Responses

Pearson correlations suggested that Black race is negatively correlated with COVID-19 awareness based on survey responses, meaning Black race is significantly associated with a decrease in sum of correct responses (r = -0.1, p<0.001). Employment in the medical profession was also found to be positively correlated with COVID-19 awareness survey scores, meaning employment in healthcare is associated with an increase in correct responses to the survey (r = 0.08, p = 0.002). In addition, level of education is also positively associated with an increase in COVID-19 awareness survey scores in a significant manner (r = 0.18, p<0.001). Gender and age were not significantly correlated with COVID-19 awareness and were excluded from the regression model.

Unique Correlates of COVID-19 Awareness Responses

A linear regression model was conducted to determine specific associations between demographic factors and COVID-19 awareness survey responses after adjusting for other demographic characteristics that were also significantly associated with the COVID-19 awareness survey responses (Table 4). Black race was negatively associated with the sum of correct responses even after adjusting for other covariates (β = -0.09, *SE* = 0.15, *p<0.001*). Compared to other racial/ethnic groups, Black adults tended to have lower total correct responses on the survey. In contrast, social standing, level of education and medical employment are positively associated with COVID-19 awareness. Thus, higher social standing is uniquely and significantly associated with a higher sum of correct responses on the COVID-19 awareness survey (β = 0.18, *SE* = 0.02, *p<0.001*). Higher levels of education are also positively and significantly associated with COVID-19 awareness (β = 0.18, *SE* = 0.03, *p<0.001*). Similarly, healthcare employment is associated with a higher sum of correct responses on the COVID-19 awareness survey (β = 0.08, *SE* =0.07, *p<0.002*).

In a second regression model that included 2-way interactions (Table 4), a significant 2-way interaction was observed between social standing and healthcare profession status (β = -0.10, *SE* = 0.05, *p<0.01*). As illustrated in Figure 1, an increase in total correct responses on the COVID-19 awareness survey was associated with a higher social standing, particularly for non-healthcare workers *(b* = 0.13, *p* < .001)*. Non-significant results were found for the other interaction terms (Back race* medical employment; level of education*COVID-19 awareness).

Discussion

In this study, Black Americans were found to have significantly lower average correct responses about COVID-19 awareness. Specifically, Black Americans scored lower on the COVID-19 awareness questions regarding availability of the COVID-19 vaccine and likelihood of COVID-19 survival. Since this study's survey was sent out many months before a vaccine became available, it is unclear whether knowledge levels improved over time. Still, these observed racial differences in COVID-19 awareness support other studies that have observed similar racial differences in COVID-19 knowledge, particularly between Black adults and non-Black adults (Shafiq et al., 2021; McCormack et al., 2021). These trends point towards greater social inequalities in health knowledge, which has been exemplified in the COVID-19 pandemic. It speculated that these racial differences can be attributed to social inequalities with health promotion campaigns. Thus, this finding highlights a potential need to tailor health promotion campaigns to be culturally sensitive to Black communities. This can be achieved through implementing community outreach programs where Black Americans can interact with health professionals about important information regarding their health and safety. This may combat misinformation about COVID-19 and overall medical mistrust which contributes to issues such as vaccine hesitancy and increased rates and deaths from COVID-19 in Black Communities. There have also been studies which have found that experiencing discrimination in any form can lead to increased mistrust of industries, including the medical industry (Williamson et al., 2019). This study also found vicarious discrimination (e.g., watching others experience discrimination) also breeds mistrust (Williamson et al., 2019). For this reason, it is the responsibility of the public health field to advocate for change in not only eradicating health disparities, but also police brutality, disproportionate imprisonment of Black individuals and poverty. It is not until

this, and many other systematic problems are addressed that the health status and knowledge of Black Americans will improve.

Level of education was found to be significantly and uniquely associated with increased level of COVID-19 awareness. On average, our sample of Black adults had a bachelor's degree/4-year degree, and no significant racial differences were observed between Black and Non-Black participants in levels of education. Thus, despite levels of education increasing the likelihood of COVID-19 awareness, it does not appear to explain the lower levels of COVID-19 awareness observed among our Black participants. A possible explanation may be that Black Americans in this sample also reported a statistically significant lower perceived social standing. Other studies have found that social standing is related to health outcomes and behaviors, which may explain why Black Americans having a lower perceived social standing may contribute to decreased knowledge levels and increased COVID-19 cases/death (Ezeamama et al., 2016). As for other sociodemographic factors examined, age and gender were not found to significantly correlate with COVID-19 awareness. A possible explanation for observation regarding age is that early in the COVID-19 pandemic, older adults were one of the first demographic groups identified in public health to be at-risk for adverse outcomes from COVID-19 (Betti et al., 2021). Thus, COVID-19 information may have targeted to older adults through several outlets, such as family, friends, medical healthcare providers, and general media. The lack of findings regarding gender could be due to our unbalanced sample size across our gender categories with a larger percentage of females representing our total sample.

Unlike much of the prior published literature on COVID-19 awareness, this study has strived to unveil how healthcare employment may further contribute to COVID-19 knowledge gaps, specifically among Black Americans. Healthcare employment was hypothesized to be an important influence on COVID-19 awareness levels given the increase likelihood healthcare workers would be exposed to information which pertains directly to the pandemic but may not be clearly and consistently communicated to the general public. For the results on healthcare employment, significant results were found regarding increased COVID-19 awareness of healthcare professionals as compared to non-healthcare professionals. More interestingly, there was not a significant difference in awareness levels based on the role within the healthcare field. Meaning simply being employed in a healthcare setting, even in non-clinical roles leads to greater knowledge about COVID-19. As for the specific questions with the most significant difference, one was asking whether there was a difference in COVID-19 recommendations based on different organization. This reflects adequate education provided to healthcare professionals about the pandemic and different health entities, such as the Center for Disease Control versus the World Health Organization. The second question which healthcare professionals answered more correctly was whether there are treatments for mild symptoms of COVID-19 available without a prescription. This observation reflects increased knowledge about over-the-counter medications to help symptoms such as ibuprofen.

While these results seem promising, there is a decrease in the entrance of Black Americans and other minorities into the healthcare field (Salsberg et al. 2021). Thus, the opportunity to obtain health information privy to healthcare professionals may be restricted from minorities, as they are underrepresented in this sector. As such, this may exacerbate the already existing knowledge gaps regarding recognizing adverse health symptomology and seeking trustworthy healthcare. Finally, it is warranted to note that despite healthcare workers tending to have higher COVID-19 awareness than non-healthcare workers, the sample of healthcare workers, on average, correctly answered approximately 4 out the 7 COVID-19 awareness questions correctly.

In particular, less than 50% correctly answered questions regarding the "Virus can be transmitted if asymptomatic" and "Public health recommendations are same by organization". Although it was surprising to observe these findings among healthcare workers, it is possible that these observations may be a result of the timing of the survey, as the survey was distributed during the early height of the pandemic. At this time health providers and researchers were still grappling with to understand the underlying mechanisms and transmission of the virus.

To further analyze the trends, interaction terms were also utilized to understand how sociodemographic factors impact COVID-19 awareness more specifically. Of these interaction terms, the only one which was significant was the 2-way interaction between social standing and healthcare profession status. For non-healthcare professionals, increasing social standing was associated with increased COVID-19 Awareness (Figure 1). Whereas social standing did not impact COVID-19 awareness for healthcare professionals, meaning there are no racial barriers to obtaining information for medical workers based on these results. The other interactions terms medical profession*Black race and medical profession*levels of education did not significantly interact with COVID-19 awareness levels.

A few limitations of the study are worth mentioning that could further explain the current observations. The sample of Black participants was generally small at 76 people, as compared to the 1,507 non-Black participants. While significant results were still found, greater diversity of the sample may have given more insight to the heterogeneity of COVID-19 awareness that may be observed with Black participants as observed for other health factors (Khariton et al., 2018). Particularly more diversity in regard to socioeconomic status (e.g., income and financial strain) measures, which were not included in this study, as well as level of education and race, would have been more representative.

As many health disparities exist within the COVID-19 pandemic, exploring the variance of knowledge levels particularly among groups at risk for inequitable health resources and adverse health outcomes is vital. While racial differences in COVID-19 cases, deaths, and resources have been documented (Souza et al., 2020; DiMaggio et al., 2020), the current study is one of the few studies to explore and observe that the relationship of COVID-19 awareness levels across several sociodemographic factors (e.g., age, race, gender, level of education, social standing). As suggested in prior literature, health inequalities in COVID-19 (including awareness) are not fully understood given increased rates of chronic diseases and environmental factors (e.g., population density) has not been found to fully explain these disproportionate trends (DiMaggio et al., 2020). Understanding the relationship between COVID-19 health knowledge and sociodemographic will allow for insight on potential reasons for health disparities within the pandemic and assist in developing methods to combat these disparities.

References

Khariton, Y., Nassif, M. E., Thomas, L., Fonarow, G. C., Mi, X., DeVore, A. D., Duffy, C., Sharma, P. P., Albert, N. M., Patterson, J. H., Butler, J., Hernandez, A. F., Williams, F. B., McCague, K., & Spertus, J. A. (2018). Health Status Disparities by Sex, Race/Ethnicity, and Socioeconomic Status in Outpatients with Heart Failure. JACC. Heart failure, 6(6), 465–473. https://doi.org/10.1016/j.jchf.2018.02.002

Hossain, M. A., Rashid, M., Khan, M., Sayeed, S., Kader, M. A., & Hawlader, M. (2021). Healthcare Workers' Knowledge, Attitude, and Practice Regarding Personal Protective Equipment for the Prevention of COVID-19. *Journal of multidisciplinary healthcare*, *14*, 229–238. https://doi.org/10.2147/JMDH.S293717

Betti, M., Bertolotti, M., Ferrante, D., Roveta, A., Pelazza, C., Giacchero, F., Penpa, S., Massarino, C., Bolgeo, T., Cassinari, A., Mussa, M., Chichino, G., & Maconi, A. (2021). Baseline clinical characteristics and prognostic factors in hospitalized COVID-19 patients aged ≤ 65 years: A retrospective observational study. PloS one, 16(3), e0248829. https://doi-org.ezaccess.libraries.psu.edu/10.1371/journal.pone.0248829

Salsberg, E., Richwine, C., Westergaard, S., Portela Martinez, M., Oyeyemi, T., Vichare, A., & Chen, C. P. (2021). Estimation and Comparison of Current and Future Racial/Ethnic Representation in the US Health Care Workforce. JAMA network open, 4(3), e213789. https://doi.org/10.1001/jamanetworkopen.2021.3789

Souza, T. A., Silva, P., Silva Nunes, A., de Araújo, I. I., de Oliveira Segundo, V. H., de Oliveira Viana Pereira, D. M., Barbosa, I. R., & de Vasconcelos Torres, G. (2020). The association between race and risk of illness and death due to COVID-19: A protocol for systematic review and metanalysis. Medicine, 99(46), https://doiorg.ezaccess.libraries.psu.edu/10.1097/MD.0000000000022828

DiMaggio, C., Klein, M., Berry, C., Frangos, S. Black/African American Communities are at highest risk of COVID-19: spatial modeling of New York City ZIP Code-level testing results. Ann Epidemiol. doi: 10.1016/j.annepidem.2020.08.012.

de Brey, C., Musu, L., McFarland, J., Wilkinson-Flicker, S., Diliberti, M., Zhang, A., Branstetter, C., and Wang, X. (2019). Status and Trends in the Education of Racial and Ethnic Groups 2018 (NCES 2019-038). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved 4 June 2021 from https://nces.ed.gov/pubs2019/2019038.pdf

Bogart, L. M., Ojikutu, B. O., Tyagi, K., Klein, D. J., Mutchler, M. G., Dong, L., Lawrence, S. J., Thomas, D. R., & Kellman, S. (2021). COVID-19 Related Medical Mistrust, Health Impacts, and Potential Vaccine Hesitancy Among Black Americans Living With HIV. Journal of acquired immune deficiency syndromes (1999), 86(2), 200–207. https://doiorg. ezaccess.libraries.psu.edu/10.1097/QAI.0000000000002570

Chollou, K.M., Gaffari-Fam, S., Babazadeh, T., Daemi, A., Bahadori, A., & Heidari, S. (2020). The Association of Health Literacy Level with Self-Care Behaviors and Glycemic Control in a Low Education Population with Type 2 Diabetes Mellitus: A Cross-Sectional Study in Iran. Diabetes, metabolic syndrome and obesity: targets and therapy, 13, 1685–1693. https://doiorg. ezaccess.libraries.psu.edu/10.2147/DMSO.S253607

Table 1

Participant Characteristics & Racial Differences in Characteristics

	n(%)	Mean (*SD*)	Black (n = 76)	Non-Black (n = 1507)	P-value
Total Sample (n = 1583)					
Age	-	48.20 (15.67)	39.19(13.18)	48.66(15.65)	**0.001**
Level of Education[a]	-	4.14 (1.15)	3.95 (1.21)	4.15 (1.14)	0.137
Gender					0.316
Female	1178(74.42)	-	55 (72.4)	1123 (81.54)	
Male	337 (21.29)	-	20 (26.31)	317 (21.04)	
Non-binary	5 (0.32)	-	0 (0.00)	5 (0.33)	
Refused to Answer	15 (0.95)	-	1 (1.32)	14 (0.93)	
Social Standing	-	7.07 (1.55)	6.37 (1.84)	7.11 (1.52)	**0.001**
Medical Professional	322 (20.34)	-	18 (23.68)	304 (20.17)	0.552

Note. **Bold** terms indicate significant findings. [a]Total sample, Black sample, and Non-Black level of education means reflects at least at bachelor's degree/4-year degree.

Table 2

COVID-19 Awareness Correct Responses in Total Sample and By Race (Black vs. Non-Black)

	Total Sample	Black	Non-Black	P-value
Gathering outdoors is safer (Item 1) [a]	1448(91.5)	71(93.4)	1377(91.4)	0.533
Virus can be transmitted if asymptomatic (Item 2) [a]	81(5.1)	1(1.3)	80(5.3)	0.123
A vaccine is not available (Item 3) [a]	1253(79.3)	47(61.8)	1206(80.0)	**<0.001**
Public health recommendations are same by organization (Item 4) [a]	1024(35.3)	28(36.8)	531(35.2)	0.775
Treatment for mild COVID-19 symptoms available over the counter (Item 5) [a]	780(49.3)	31(40.8)	749(49.7)	0.129
Positive antibody test does not determine date of contraction (Item 6) [a]	1147(72.5)	47(61.8)	1100(73.0)	0.034
Most people who get COVID-19 will survive (Item 7) [a]	1444(91.2)	59(77.6)	1385(91.9)	**<0.001**
Sum of correct responses[b]	4.24(1.7)	3.74(1.5)	4.27(1.1)	**0.003**

Note. [a]Numeric values reflect frequency count (percentage). [b]Numeric values reflect mean (standard deviation).

Table 3

COVID-19 Awareness Correct Responses in By Medical Profession Status

	Non-Medical Profession (n = 1213)	Medical Profession (n = 322)	P-value
Gathering outdoors is safer (Item 1) [a]	1113(91.8)	293(91.0)	0.661
Virus can be transmitted if asymptomatic (Item 2) [a]	65(5.4)	14(4.3)	0.466
A vaccine is not available (Item 3) [a]	970(80.0)	249(77.3)	0.298
Public health recommendations are same by organization (Item 4) [a]	405(33.4)	140(43.5)	**<0.001**
Treatment for mild COVID symptoms available over the counter (Item 5) [a]	576(47.5)	184(57.1)	**0.002**
Positive antibody test does not determine date of contraction (Item 6) [a]	876(72.2)	242(75.2)	0.292
Most people who get COVID-19 will survive (Item 7) [a]	1104(91.0)	305(94.7)	0.031
Sum of correct responses [b]	4.21(1.14)	4.43(1.08)	**0.002**

Note. [a]Numeric values reflect frequency count (percentage). [b]Numeric values reflect mean (standard deviation).

Table 4

Linear Regression Models to Explore the Association between COVID-19 Awareness Correct Total Responses and Demographic Characteristics

	Model 1 β (SE)	Model 2 β (SE)
Black race	-0.47(0.15)***	-0.39(0.15)**
Social standing	0.11(0.02)***	0.13(0.02)***
Level of education	0.13(0.03)***	0.13(0.03)***
Employment in Healthcare	0.21(0.07)**	1.00(0.37)**
Black race*Medical employment	-	-0.38(0.31)
Social standing*Medical employment	-	-0.10(0.05)**
Level of education*Medical employment	-	-0.01(0.06)
R^2	0.939	0.940
F-Ratio	4673.63	2918.75
p-value	0.000	0.000

Note. Asterisks indicate level of significance as follows: *$p < .05$. **$p <.01$. ***$p <.001$.

Figure 1. Two-way Linear Interaction Model between Social Standing and Healthcare employment