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Research Article

Does Age-Stratification Impact Medical-Mistrust Perceived by the Black-American Population?

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Abstract

The health status for Black-Americans is worse than other ethnic groups due to less seeking of medical care. Many Black-Americans refuse to seek medical care due to a distrust of the medical establishment. Cultural-distrust, which perpetuates medical-mistrust, was used as the theoretical framework for this study. It has been established that medical-mistrust by the Black-American population correlates with to the underutilization of healthcare services, resulting in inferior outcomes and increased healthcare cost and burden to society. The study aimed to determine if age (age group or age-stratification) and medical-mistrust adversely affect healthcare utilization in Black-Americans when controlling for gender, income, insurance status, and education level, using the Medical Mistrust Index and Group-Based Medical Mistrust Scale as data collection tools.

Results from 148 surveys collected from Black men (n = 57) and women (n = 91) in Orlando, Florida, USA revealed a negative significant relationship between medical-mistrust and healthcare utilization (r = -.023) when controlling for gender, income, insurance status, and education level. Further, it was found that a non-significant bivariate relationship exists between age (r = .032) and healthcare utilization among Black-Americans. The results indicated that Black-Americans of all age groups harbor mistrust of healthcare on a near-equal basis per age-stratification.

This research adds to the knowledge-base that medical-mistrust discourages healthcare-seeking behaviors and decreases healthcare utilization by the Black-American population. These findings bring to the forefront the fundamental social, policy, and attitude changes needed to assist Black-Americans to overcome their mistrust in medicine and increase utilization of healthcare services, which decreases the financial burden to society and avoids the emotional fallout due to unnecessary illness and premature death.

A disproportionate number of Black-American men and women are affected by obesity and diabetes. Black-Americans have a high risk for type 2 diabetes and a high rate of diabetic complications due to poor glycemic control and racial disparities in the United States' healthcare system.

Thus, in the prevention, management, and treatment of type 2 diabetes, physicians and healthcare providers should be sensitive to the persistent medical-mistrust embedded in the psyche of the Black-American population—and be aware that, even though younger Black-Americans are living in a more inclusive society, they might still harbor mistrust of the healthcare system on par with their older counterparts. All medical practitioners in every medical specialty should be aware of this mistrust (and how it discourages positive healthcare-seeking behaviors) and respond accordingly.

Keywords: *Black-American; Biopsychosocial; Cultural Mistrust; Diabetes; Racism*

Abbreviations

CAL: Cardiac Access Longitudinal; CMI: Cultural Mistrust Inventory; GBMMS: Group-Based Medical Mistrust Scale; GNP: Gross National Product; H: Hypothesis; MetS: Metabolic Syndrome; MMI: Medical Mistrust Index; NGO: Non-Governmental Organization; PRMHC: Perception of Racism and Mistrust in Healthcare; PRS: Perceptions of Racism Scale; QoL: Quality of Life; RQ: Research Question

Introduction

In two recently published papers by Pruitt and Kerna (2020), medical-mistrust perceived by the Black-American population was firmly established [1,2]. (Further studies supporting the researchers' conclusion are provided in the following sections). However, age-stratification has not been addressed or investigated adequately—by any researchers—regarding medical-mistrust recognized by the Black-American population. This research attempts to fill this gap in that particular research: medical-mistrust according to age in the Black-American population. According to age (age group or age-stratification), determining medical-mistrust by the Black-American population is considered valuable research. If differences in medical-mistrust by the Black-American population—according to age-stratification—do exist, then resources earmarked to address the medical mistrust issue (and the resultant poor healthcare-seeking behaviors) can be allocated more directly and effectively. Thus, the United States government and non-governmental organizations (NGOs) can better address this issue. For example, if younger Black-Americans have less medical-mistrust than their older counterparts, more (of the limited) resources could be directed to lessening this mistrust in the older population. With limited resources, this approach seems prudent and, thus, research regarding any age differences in medical-mistrust experienced by the Black-American population seems worthwhile. The following information describes the original research and conclusions regarding medical-mistrust according to age in the Black-American population.

Discussion

Background to the research study (further data confirming medical-mistrust perceived by the Black-American population)

The Group-Based Medical Mistrust Scale (GBMMS) was originally designed to measure medical-mistrust by Black and Latina women (N = 168) [3]. The researchers' goal was to measure the level of medical-mistrust relating to breast cancer screening. In other words, the GBMMS sought to measure medical-mistrust as a barrier to breast cancer screening.

The scale is composed of three general areas or subscales: 1) suspicion, 2) group disparities in healthcare-seeking behavior, and 3) the deficit of support from healthcare providers (physician and supporting healthcare staff). Previous medical-mistrust literature on underserved ethnic groups helped formulate seven of the twelve questions on the survey. The seven questions comprise three general areas. The first is the belief that certain ethnic groups do not receive proper healthcare information when being serviced by medical personnel. Treatment insensitivity is the second area, while the third is lack of care comparable to other groups. Thus, the seven questions encompass group disparities for healthcare [3].

The suspicion measurement comprises two modified questions taken from the Cultural Mistrust Inventory (CMI). Thompson., *et al*. (2004) modified the two questions to include verbiage that emphasized physician and healthcare staff. For example, "people of my ethnic group should not confide in doctors and healthcare workers because it will be used against them" [3(p211)]. The other question reads, "people of my ethnic group should be suspicious of information from doctors and healthcare workers" [3(p211)].

Two other questions from the scale were derived from the Perceptions of Racism Scale (PRS). This part of the scale was developed to assess perceived racism among Black women across different social domains. As such, these questions were used to measure healthcare disparities. For instance, one question is, "people of my ethnic group are receiving the same medical care from doctors and healthcare

workers as people from other groups" [3(p211)]. Still, the other question deals with an assessment of hospital systems. For example, the question is worded "in most hospitals, people of different ethnic groups receive the same kind of care" [3(p211)].

The final question on the scale was modified by researcher Hughes in 1996 to ascertain ethnic differences in risk perception among women for an increased chance of breast cancer. The researcher focused on the disadvantages of genetic testing for cancer. Hence, the modified question used on the GBMMS was "people of my ethnic group should be suspicious of modern medicine" [3(p211)].

The GBMMS was developed for use in the minority female population. However, Shelton., *et al*. (2010) used it as a measurement tool in urban Black men. The researchers included Black men (N = 201) from New York City between 2006 to 2007 to determine the psychometric properties of the GBMMS in a Black male sample [4]. The measurement goals were medical-mistrust, healthcare participation, avoidance of healthcare, racial identity, healthcare satisfaction, residential racial segregation, and attitudes towards prostate cancer screening. The results revealed high internal consistency ($\alpha = 0.87$) for the instrument. The three subscales also produced adequate internal consistency: suspicion ($\alpha = 0.89$), discrimination ($\alpha = 0.83$), and lack of support ($\alpha = 0.65$) in this sample population [4].

Likewise, Hughes-Halbert., *et al*. (2009) used the GBMMS in a male population of Blacks (N = 71) and Whites (N = 125) to assess the feasibility of the instrument in determining medical-mistrust during the diagnosis of prostate cancer. The results yielded that Black men ($p = .01$) have higher medical-mistrust levels than Whites [5]. Thus, the researchers were also able to conclude that the GBMMS can be successfully utilized in the male population to measure medical-mistrust [4]. As such, the instrument was utilized in both Black men and women for this study. The final instrument used in the study was the Medical Mistrust Index (MMI).

The MMI was developed for cardiac patients to assess the extent to which perceived racism and medical-mistrust determined satisfaction with medical care. Thus, according to LaVeist., *et al*. (2000), the conceptual framework for the creation of the MMI was to determine if "race is a gauge of patient satisfaction" [6(p148)]. Adopting patient data from the 1994 Commonwealth Fund Minority Health Survey, found that individual predisposing characteristics (such as education, age, gender, attitudes, health insurance, and frequency of medical encounters) are elements of patient satisfaction [6].

Expounding on this premise, LaVeist., *et al*. (2000) determined the degree to which these characteristics affect medical-mistrust of healthcare providers and systems [6]. Thus, the healthcare providers and the healthcare system trust constructs were explored as the cardiac patient population required multiple medical system visits. The Black and White (N = 1784) sample population was taken from three Maryland State Hospitals. The three hospitals were chosen because being that each was enrolled in the Cardiac Access Longitudinal (CAL) study, investigating medical care utilization, access, and quality of life (QoL) in cardiac patients. Participants were chosen from the CAL study as a subset to answer questions on a 4-point Likert scale (strongly disagree, disagree, agree, strongly agree) about medical-mistrust. Recruits were asked questions, such as: "doctors treat African American and White people the same" and "patients have sometimes been deceived or misled at hospitals" [6].

The results of the study showed that Blacks and Whites differ in healthcare system mistrust. Black cardiac patients were (91%) more likely to feel that Whites receive better healthcare treatment [6]. Hence, Blacks reported more distrust of the medical care system and were less satisfied with provider care than Whites [6]. It was also concluded that Blacks have greater medical-mistrust due to life experiences with perceived and real discrimination. Therefore, medical-mistrust has become entrenched in the behavior and attitudes of Blacks [6]. These attitudes tend to adversely affect healthcare-seeking behaviors of Blacks.

Egede., *et al*. (2006) explored how medical-mistrust can alter self-management, glycemic control, and health-related QoL in indigent, type-2 diabetic patients. A sample of Black and White participants (N = 216) was given the MMI and the 23-item Diabetes Knowledge Test to determine the level of medical-mistrust and self-care diabetes knowledge [7]. The researchers concluded that less distrustful patients felt more in control of their diabetic disease state ($r = -0.173$, $p = 0.012$). Also, these less distrustful patients displayed better mental ($r = -0.192$, $p = 0.006$) and physical health ($r = -0.141$, $p = 0.044$). These findings are congruent with other studies that posit higher mistrust equals poorer health outcomes [7,8].

Hammond (2010) explored the correlation between medical-mistrust by Black men (N = 216) and psychosocial factors using the MMI as a measurement tool. Psychosocial factors were defined as masculine role identity, age, discrimination experiences, and patient-physician interaction quality. The researcher concluded that many factors affect medical-mistrust by Black men [9]. For example, masculine role identity played an essential part in the patient-physician relationship [9], often being an impediment to trust-building. Likewise, personal characteristics, such as age, previous negative medical experiences, and racism expectations, adversely impacted medical trust.

Research questions and hypotheses

Research question 1: To what extent do medical-mistrust and age affect healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender?

- Ho1: Medical-mistrust and age do not statistically affect healthcare utilization in the Black population when controlling for education level, economic income, health insurance status and gender ($R2change = 0$).

- Ha1: Medical-mistrust and age statistically affect healthcare utilization in the Black population when controlling for education level, economic income, health insurance status and gender ($R2change > 0$).

Research question 2: To what degree does medical-mistrust of healthcare providers and age predict healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender?

- Ho1: Medical-mistrust of healthcare providers and age do not statistically predict healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender ($R2change = 0$).

- Ha1: Medical-mistrust of healthcare providers and age statistically predict healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender ($R2change > 0$).

Research question 3: To what extent does age and medical-mistrust of healthcare systems have on healthcare utilization in the Black population if education level, economic income, health insurance status, and gender are controlled?

- Ho1: Age and medical-mistrust of healthcare systems have no statistically significant effect on healthcare utilization in the Black population if education level, economic income, health insurance status, and gender are controlled ($R2change = 0$).

- Ha1: Age and medical-mistrust of healthcare systems have a statistically significant effect on healthcare utilization in the Black population if education level, economic income, health insurance status, and gender are controlled ($R2change > 0$).

Variables

- Dependent variable: healthcare utilization.
- Independent variables: age and medical-mistrust.
- Control variables: education level, economic income, gender, and health insurance status.

Research design, method, and rationale

The MMI was utilized in this study to show the relationship between medical-mistrust, age, and healthcare-utilization or healthcare-seeking behaviors in Blacks. Five healthcare utilization questions were used to gather healthcare-seeking behaviors in the Black population.

The study utilized a cross-sectional quantitative survey design. A purposeful sample of Black men and women from Orlando, Florida, USA, was used to obtain information about their background, healthcare-related experiences, and attitudes towards medical care. The information was obtained through questionnaires regarding medical-mistrust of the hospital, provider, and healthcare system. This study aimed to discern if any differences exist in medical-mistrust levels by the Black population according to age affecting healthcare utilization.

The quantitative survey method offered several advantages for conducting this type of research. For example, according to Frankfort-Nachmias and Nachmias (2008), survey research offers five distinct advantages: low cost, reduction in biasing error, greater anonymity, considered answers and consultations, and accessibility [10].

Low cost

This survey method (of data collection) allowed for administering questionnaires to a wide range of socioeconomic and diverse participants from a specific geographic area. Comparably, having to maintain staff to conduct face-to-face interviews could be cost-prohibitive. Therefore, this method was chosen for its economic viability.

Reduction in biasing error

Interviewer bias is a probability in face-to-face interaction between an interviewee and interviewer. Using the survey system method helped eliminate this risk to internal validity as participants did not feel pressured to answer questions under the interviewer's guidance [10].

Greater anonymity

When a face-to-face interview is avoided, it can alleviate uncomfortable situations that sensitive issues, such as racism, can cause the participant. Therefore, this research design offered autonomy and comfort for participants in answering questions truthfully without undue social pressure from an interviewer [11].

Thoughtful answers

Unlike an in-person interview, the survey method allowed participants the requisite time to thoughtfully answer questions. In other words, it allows the participants to consider their answers and chose the best available response rather than providing a spur of the moment response.

Accessibility

Lastly, the survey method allowed a large pool of participants to enter the study at one point in time, affording the advantage of meeting necessary quotas (levels of participants) rapidly. For example, this study recruited from a pool of potential participates of a predominantly Black church located in Orlando, Florida, USA. Thus, a diverse cross-sectional representation of Black healthcare views was readily obtained.

Summary of the research design, method, and rationale

Notwithstanding the advantages to this design method as mentioned above, there were limitations:

- Questions on the survey must be straightforward and easy to understand because no interviewer was present to explain questions for the participants.
- Questionnaires limit the researcher's ability to probe for additional information [12].
- There was a lack of control over who completed the questionnaire.
- Finally, according to Frankfort-Nachmias and Nachmias (2008), the respondent rate for questionnaires and surveys can be low, making it difficult to reach the number of recruits needed to achieve the necessary effect size [10]. To overcome this limitation, surveys were collected after church service to enhance fulfillment objectives, which encouraged recruits to return completed surveys.

For statistical purposes, hierarchical multiple regression analysis was used to ascertain the relationship between medical-mistrust, provider-distrust, and healthcare system-mistrust by Blacks according to age (Gender, health insurance, economic status, and education may confound the relationship between the dependant variable of healthcare utilization and the independent variables of age and medical-mistrust).

Therefore, the cofactors were held constant throughout the study. However, a bivariate analysis was undertaken to determine the association between covariates and dependent variables. Thus, hierarchical multiple regression analysis enabled covariates to be marginalized while the relationships between groups were analyzed [13].

This statistical method is preferred when determining group relationship for continuous predictor variables and criterion variables [14]. For instance, Bell (2009) used the survey inquiry method in conjunction with multiple regression analysis to explore Blacks' help-seeking behaviors for counselor preference [15]. According to Field (2009), hierarchical multiple regression analysis reduces the within-group error of variance and minimizes cofounders' effects by allowing the researcher to separate variables by group or model [13]. This method also provides flexibility in analyzing aspects of the dependent variable and covariates related to linearity across groups [14]. Also, the experiment instruments produce numerically-coded answers, which functions well with a hierarchical multiple regression analysis.

The GMMBS instrument used to collect data for this experiment included scale-rated questions. All survey questions were rated on Likert-scale answers, such as "strongly agree" or "disagree". Thus, these qualifier answers allowed the data to reflect the level of a particu-

lar judgment. These ordinal ranking-scale questions were numbered, providing a numerical value or score for each question; for example: 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree. The sum from each question was determined, generating a total score. (In contrast, the MMI consisted of dichotomous response questions that were answered by "yes" or "no".) Once numerical values were assigned to the instruments and survey data collected, statistical analysis was conducted using hierarchical multiple regression analysis. However, specific assumptions are needed for proper multiple regression analysis:

- All predictor variables must be categorical or quantitative.
- The criterion variable must be continuous and quantitative.
- The variable must have non-zero variance.
- The variables must have non-perfect multicollinearity: predictor variables too closely correlated can cause the regression model to produce unacceptable standard errors.
- The predictor variables must be uncorrelated with external variables, which could influence the results.
- The data should fall within a skewness of -1.0 to 1.0 and kurtosis of -2.0 to 2.0 [16].

(A Durbin-Watson value greater than 3 is indicative of outliners.) Any outliners greater than 3 must be eliminated before the model can be deemed reliable [14].

In this study, the relationship between the criterion variable and covariates was the same for all groups. According to their quantitative dimensions, this relationship allowed the factor to be categorized into levels while differentiating the dependent and covariate variables. For example, medical-mistrust (independent variable) was measured in three levels (low, moderate, high) according to the score.

Setting and sample

The study population was selected from a large (greater than 900 members) community-based, predominantly Black church located in Orlando, Florida, USA. The recruits came from various and diverse socioeconomic backgrounds. The church's demographic makeup was 60% adult female, 30% adult male, and 10% children.

The setting was metropolitan or inner-city for the reason that the United States Census Bureau (2011) defined Orlando, Florida, as a large city surrounded by smaller municipals. According to the United States Census Bureau (2011), the City of Orlando, Florida, comprised 28.1% Black residents [17]. Males and females, age 18 and older, were enrolled in the study.

Sampling method

This quantitative study used a purposeful quota sample of equal numbers of Black males and females. All participants received a demographic questionnaire to determine age, years of schooling, gender, health insurance status, and racial/ethnic background. The eligibility requirements for the study were being Black and over the age of eighteen.

A computation analysis was performed using G*power 3.1.4 computer program [18]. Using an alpha value of 0.05, a beta of .80, and an effect size of 0.15 (medium), indicated that 68 participants were required for the study. As many people as possible were recruited, to achieve at least 68 recruits for the study. The final number of recruits was 156. The quota goal was 50% Black females and 50% Black males. However, the final tally was 61.5 % female and 38.5% male.

Each survey was assigned a number. The program, Research Randomizer [19], selected surveys to be in the study according to their number. This randomizer process aided in the nonbiased selection of recruits and control for systematic selection bias, affecting internal validity [10].

Instrumentation

Group-based Medical Mistrust Scale (GBMMS)

All participants received a GBMMS to determine provider and healthcare system mistrust in Blacks according to age [3]. The GBMMS is a 12-item Likert scale survey that measured mistrust of medical providers, the healthcare system, supposed support from providers, and providers' racial discrimination expectations. This survey asked recruits to answer questions relating to three constructs:

- Provider and healthcare worker suspicion
- Beliefs on healthcare group disparities
- Perception of lack of support from healthcare providers.

The survey posed questions, such as: "doctors and healthcare care workers treat people of my ethnic group like guinea pigs" [3(p213)]. The participants had the option of answering 1 (strongly disagree) to 5 (strongly agree).

The scoring range was 12 to 60. The higher the score, the greater the mistrust. For example, a score of 29 or less constituted low provider- and healthcare system-mistrust. Scores between 30 and 39 were considered moderate. Persons scoring greater than 40 were considered to have high medical-mistrust of healthcare providers and systems.

Scores and levels were entered into the SPSS program. Scores of 29 or less were coded into the SPSS program as 1. Scores between 30 and 40 were coded as 2. Scores greater than 40 were coded as 3 in the SPSS program. The GBMMS has been validated for use in the Black population [3]. Validity and internal consistency ($\alpha = 0.86$) were acceptable for this research. Utilizing the GBMMS demonstrated the following advantages:

1. It measured group perception and not individual perception.
2. The tool was developed to measure ethnic minorities (Black and Latino).
3. Views and opinions can differentiate group mistrust from distrust.
4. It measured institutional mistrust [4].

The GBMMS served to collect data that answered research questions one through three.

Medical Mistrust Index (MMI)

The MMI determines the extent of age that affects healthcare utilization in Blacks [6]. The original MMI is a 17-item Likert scale tool used to measure the mistrust for healthcare providers, hospitals, and healthcare systems. The MMI has questions, such as "racial discrimination in a doctor's office is common" and "hospitals have sometimes done harmful experiments on patients without their knowledge" [6(p152)]. Responses can range from "strongly agree" to "strongly disagree". According to Brandon., *et al*. (2005), the index has a reliability of $\alpha = 0.76$ [20]. This tool has also been utilized in the Black population by LaVeist., *et al*. (2000) [6].

To avoid redundancy, hospitals, health systems, and health provider questions from this original index were not used. Instead, healthcare utilization questions from a revised MMI were used. LaVeist., *et al*. (2009) revised the MMI from a 17-item instrument to a 7-item tool [21]. The purpose of the revision was to validate the instrument and add the construct of underutilization of healthcare services. The index was explicitly modified to determine the relationship between medical-mistrust and healthcare utilization in a targeted population [21].

A validity and reliability test was performed on the instrument using revised healthcare utilization questions. The modified survey asks questions, such as: "during the last 12 months, was there any time when you had a medical problem but put it off, postponed, or did not seek medical care when you needed it because you do not trust the medical community" [21(p2101)]. Participants have the choice of answering these questions as "yes" or "no". The "yes" answers were coded into the SPSS program as 1, and "no" answers as 0. Thus, dichotomous answers given, unlike the rest of the scale, which uses a Likert format.

The test-retest reliability for item-to-item correlations was moderately strong ($\alpha = 0.346 - 0.697$). Multivariate modeling was predictive for four of the five measures of healthcare service underutilization:

1. Failure to keep a follow-up appointment ($b = 1.11$, $p = .01$)
2. Failure to take medical advice ($b = 1.56$, $p < .01$)
3. Failure to fill a prescription ($b = 1.48$, $p = .002$)
4. Postponing needed care ($b = 0.939$, $p = .01$).
5. Failure to get needed care did not correlate well ($b = 0.815$, $p = .06$).

Overall, the scale had a test-retest correlation of 0.69. Therefore, according to LaVeist., *et al*. (2009), this MMI was validated in predicting the underutilization of healthcare services in a targeted population [21].

Other parts of the MMI measured healthcare system distrust and healthcare provider mistrust using the GBMMS survey. For this study, only the five healthcare utilization questions were used to gather data for the dependent variable "healthcare utilization in Blacks related to age and medical mistrust". An affirmative response to any one of the five MMI questions indicated underutilization. Thus, questionnaires with at least one yes answer on the MMI were coded as 1. Surveys with no affirmative responses to any of the five questions on the MMI indicated no deterrent to healthcare utilization due to medical-mistrust and were coded as 2.

Validity

This research attempted to protect internal validity in various ways. Validity was preserved according to content, construct, and sampling. This research pursued answers to the question of medical-mistrust by the Black population. Thus, the measurement tools used to collect data should support this construct. The GBMMS was designed to measure content relating to medical-mistrust. The MMI was used to correlate medical-mistrust and healthcare utilization in Blacks. Both instruments have been used within the Black population previously in measuring healthcare-seeking behaviors and medical-mistrust (content validity).

Consequently, the indicator questions and statements were representative of medical-mistrust (sampling validity). Other mechanisms were used to enhance internal validity, including random selection for entrance into the study to reduce selection bias and "blinding" of the surveys. This enhancement of internal validity decreased the chance of selection bias that could affect internal validity.

Data collection

As stated previously, participants were recruited from a predominantly Black church located in Orlando, Florida, USA. A purposeful quota sample of an equivalent number of male and female recruits was utilized, increasing the study's population generalization power. All participants were placed in one of three groups according to age. The first group was comprised of individuals age 18–40, coded as 1 in the SPSS program. The second group was age 41–60, coded as 2. The third group was 61–95, coded as 3.

Recruits were given the consent form and surveys during the church's Sunday dinner activity inside the dining area. Participants freely picked up consent forms and surveys upon entering the dining area (from a table at the dining area entrance). The participants had one hour +/- fifteen minutes to fill out the surveys before dinner was served. The entire dinner activity lasted about two hours. The first hour was used for fellowship and socializing. Thus, there was ample time to read and complete the surveys. The three surveys took approximately fifteen minutes to complete. All returned surveys were placed in a dropbox as the participants exited the dining area.

This data-collection process protected the individual participants' privacy and allotted the requisite time to complete all surveys without time constraints. The completed surveys were collected from the dropbox after the dining event. The age-range of church membership is eighteen and greater. Three different surveys (Demographic, MMI, and GBMMS) were used to obtain specific data. The demographic survey served to determine which people met the general requirements for the study. (The requirements for entering the study were being Black and over the age of eighteen).

Next, all returned surveys were checked for integrity. This process involved determining whether all questions and sections were answered and noting respondents' ethnicity and age. (The church is predominantly Black. However, other ethnicities can also be members. Therefore, race needed to be validated.)

Selected participants were placed into a group based on age. All eligible recruits had an equal chance of being selected into the study by assigning each survey a number. The computer program Research Randomizer selected completed surveys to be included in the study based on the assigned numbers. The scores of the returned surveys were tallied.

The surveys, GBMMS and MMI, provided a quantitative description of attitudes, perceptions, help-seeking behaviors, and views of the targeted Black population, regarding medical-mistrust and healthcare-seeking behaviors. Scores collected from these surveys were further analyzed using a statistical method of hierarchical multiple regression analysis. Cofounding variables, such as health insurance status, gender, economic status, and education level, were controlled. Permission was granted by the appropriate authorities to use the GBMMS and MMI surveys as data gathering tools.

Data analysis

The analysis tool, SPSS v.21.0 for Windows, was employed for data interpretation. Descriptive statistics were used for demographic data. This method provided information on means and standard deviations from the ratio and interval data contained within the sample. Further analysis was performed using hierarchical multiple regression analysis in determining the relationship between age, medical-mistrust, and healthcare-utilization.

According to Green and Salkind (2011), the covariates can be entered into the model first, allowing for isolation of effects [14]. Thus, health insurance status, education level, gender, and economic income status were entered into the program first as Model 1. Health insurance and gender are categorical binary variables; answers were coded as either 0 or 1. For example, males were coded into the SPSS program as 0 and females as 1.

Having health insurance was coded as 1 and not having health insurance as 0. Education was coded as 0 for elementary school, 1 for middle school, 2 for high school, 3 for some college, 4 for a college graduate, and 5 for graduate school. Economic income followed the same coding as education for respective levels. Next, the predictor variables of medical-mistrust and age were entered into the SPSS program as Model 2. By entering variables in this sequence, a precedent was placed on the predictor variables (age and medical-mistrust). The criterion variable (healthcare utilization) was entered into the program as the dependent variable.

The GBMMS was comprised of three levels (low, moderate, and high) based on score. Covariant variables were kept constant, illustrating if there was an actual difference between age groups regarding the level of medical-mistrust and healthcare-seeking behavior.

Ethical considerations

An informed consent form was given to all participants before starting the data collection process. There was no withholding of necessary treatment or invasive procedures as part of the study. Approval was granted by the Institutional Review Board (IRB) at Walden University (IRB no#: 07-25-13-0235076). All surveys were assigned a random number to neutralize any confidentiality concerns to ensure identity protection, and no signatures were obtained. No coercive persuasion was used to recruit participants. Entering into this research study was not mandatory. No physical experimentation was conducted. Participants were subject to questionnaires and surveys only. Lastly, the study's goal was to provide benefits for Blacks—going beyond any contingency or encumbrance placed on the recruits in agreement with ethical and United States federal regulations standards [22].

Study summary

This quantitative study collected data using a research survey method among Black male and female participants. Medical-mistrust was measured using the GBMMS. Healthcare utilization was measured with a validated MMI. Statistical analysis was performed using hierarchical multiple regression analysis. The independent variables were medical-mistrust and age. The dependent variable was healthcare utilization.

The study intended to ascertain whether medical-mistrust and age predict healthcare utilization in Blacks after controlling for health insurance status, gender, economic status, and education. The independent variable, age, was measured according to self-reported answers on the demographic questionnaire. Also, data for the control variables were obtained from self-reported information on the demographic questionnaire.

The independent variable, medical-mistrust of providers and healthcare systems, was measured according to answers provided from the GBMMS. The dependent variable, healthcare utilization, was measured according to answers provided from the MMI.

Characteristics of participants

Two hundred and twenty-five surveys were made available to recruits. A total of 156 (69%) surveys were returned. Of the 156 surveys returned, 148 were usable (65%). According to Faul., *et al*. (2009), a minimal number of 68 participants are needed to satisfy the effect size and independent variable case ratio requirements. Thus, the 156 surveys collected for this study exceeded the number needed to achieve adequate data computation.

The sample characteristics were Black males (38.5%) and Black females (61.5%). The complete sample was derived from a single church located in Orlando, Florida, USA. Of the 156 surveys returned, 148 were randomized into the study. The program Research Randomizer indicated that 68 surveys (out of the 225) should be eliminated to create a random sample. The selection process eliminated

77 surveys, which exceeded the necessary elimination amount. For example, 5 (2%) of the respondents were eliminated due to racial variation, as they selected a racial group other than Black. The remaining surveys (32%) were eliminated due to incomplete answering of questions or failing to return a survey to the dropbox for collection. All surveys were distributed and collected within 2 hours on a single Sunday afternoon. Self-reported control variable statistics are depicted in Table 1.

In this purposeful sample of Black men and women, 78.4 % had health insurance, while 21.6 % did not. Also, 21.6 % of the participants' education level consisted exclusively of high school, while 18.2 % had some college. College graduates accounted for 27 % of the sample, while 31.8 % of the participants went to graduate school (Table 1). The most common category for income in the sample was less than $40,000 per year group (Table 1).

Control Variables	Frequencies (%)
Gender	
Male (= 0)	57 (38.5)
Female (= 1)	91 (61.5)
Insurance status	
No health insurance (= 0)	32 (21.6)
Has health insurance (= 1)	116 (78.4)
Education (Highest school attainment)	
Elementary School (= 0)	1 (0.7)
Middle School (= 1)	1 (0.7)
High School (= 2)	32 (21.6)
Some College (= 3)	27 (18.2)
College Graduate (= 4)	40 (27)
Graduate School (= 5)	47 (31.8)
Economic income status	
Less than $40, 000 yearly (= 0)	73 (49.3)
$41,000-$60,000 yearly (= 1)	30 (20.3)
$61,000-$80,000 yearly (= 2)	19 (12.8)
$81,000-$100,000 yearly (= 3)	8 (5.4)
$101,000-$150,000 yearly (= 4)	14 (9.5)
Over $150, 000 yearly (= 5)	4 (2.7)

Table 1: *Descriptive statistics for control variables.*

The largest age-group was the 18 – 40 category, which made up 45.3% of the sample. The smallest segment of the sample was the 61 – 95 age-group (13.5 %), as noted in Table 2.

Independent Variable	Frequencies (%)
Age (in years)	
Group 1 (18 - 40) years	67 (45.3)
Group 2 (41 - 60) years	61 (41.2)
Group 3 (61 - 95) years	20 (13.5)

Table 2: *Descriptive statistics for age.*

Results

A majority of participants in this study had moderate medical-mistrust of healthcare, according to their GBMMS scores. The total scale range was 12–60. A score between 12–29 indicated low medical-mistrust [3]. A score over 40 indicated a high level of medical-mistrust. Only 5 (3.4 %) participants fell within this range. In contrast, 90 recruits scored between 30–40 (60.8 %), displaying a moderate medical-mistrust level.

The GBMMS contained twelve questions. The mean answer was 1.67, with an SD = .537. The range for the GBMMS is minimal 1 and maximum 5. The MMI contained five items. The mean of the answers was 1.43, with an SD = .497. The range for the MMI is minimal 1 and maximal 2.

Bivariate analysis

The degree to which the control variables interacted with the dependent variable is depicted in Table 3. No significant interactions were found between healthcare utilization and the control variables

Variables	Healthcare Utilization
Education	
Spearman's rho	.079
Sig. (1-tailed)	.169
Gender	
Point Biserial	.001
Sig. (1-tailed)	.495
Health Insurance Status	
Point Biserial	.035
Sig. (1-tailed)	.337
Economic Income Status	
Spearman's rho	.026
Sig. (1-tailed)	.377
Age	
Pearson r	.032
Sig. (1-tailed)	.350
Medical Mistrust	
Pearson r	-.023
Sig. (1-tailed)	.389

Table 3: *Correlation between control, independent, and dependent variable. Note. * = $p \leq .05$.*

There was some weak correlation between age and healthcare utilization (r = .032). However, statistical significance was not achieved (p = .350). The correlation for medical-mistrust was negatively associated (r = -.023) with no statistical significance reached (p = .389).

Assumption testing

Normality: The results indicated that the normality for the dependent variable (healthcare utilization) was .248. This skewness fell between -1.0 and 1.0. Thus, normality was met according to parameters for skewness [14]. The dependent variable's kurtosis was -1.96, which fell between -2.0 and 2.0 as the customarily accepted range for kurtosis [16].

The independent variable age was normally distributed with skewness of .530 and kurtosis of -.839. Both numbers met the qualifications of normality [14]. The independent variable, medical-mistrust, showed skewness of -.074 and kurtosis of -.730. Both numbers fell within the acceptable range [9].

The assumption for homogeneity of variance was analyzed using Levene's test. The control variables were homogeneous (gender, education attainment, health insurance status, economic status), F (5,142) = 1.80, p = .11. The probability (p = .11) was greater than the significance level for assumption testing (0.01). Thus, the homogeneity of variance assumption was satisfied [16].

The Durbin-Watson test determined homoscedasticity—the boundaries being 1 to 3 for homoscedasticity [13]. The independent variables, age and medical-mistrust, equaled 1.71. Thus, homoscedasticity was met as the number fell within the 1 to 3 range.

Finally, Models 1 (control variables) and 2 (independent variables) were tested for outliers by analyzing Durbin-Watson residual test values (-3.0 to 3.0). A minimum residual Durbin-Watson value of -1.05 and a maximum value of 1.36 was applied. The 148 surveys reviewed fell between -3 and 3, indicating no outliers. Thus, all hierarchical multiple regression were met [14], and Models 1 and 2 were considered reliable.

Research question 1 asked, to what extent medical-mistrust and age affect healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender?

Ho1: Medical-mistrust and age do not statistically affect healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender.

Ha1: Medical-mistrust and age statistically affect healthcare utilization in the Black population when controlling for education level, economic income, health insurance status, and gender.

The model summary for healthcare utilization, after controlling for gender, health insurance status, education level, and economic status, is displayed in Table 4.

Model 1 includes economic status, gender, health insurance status, and education level, which control the study. Model 2 contains economic status, gender, health insurance status, education level, independent variables, age, and medical-mistrust (Table 5). Age and medical-mistrust accounted for no additional variance in healthcare utilization (p = .917). Accordingly, age and medical-mistrust did not significantly change healthcare utilization (R2 = 0).

In Table 5, both Model 1, F (4, 143) = .240, p = .915 and Model 2, F (6, 141) = .187, p = .980 for the regression coefficients were non-significant. Thus, the data analysis supported not rejecting the null hypothesis for research question 1. There were no missing values to report. All surveys randomized in the study were used to answer research question 1.

Model	R	R2	Adj. R2	Std. Error		Change Statistics			
				of Est.	R2Change	F Change	df1	df2	Sig. F Change
1a	.082	.007	-.021	.503	.007	.240	4	143	.915
2b	.089	.008	-.034	.506	.001	.086	2	141	.917

Table 4: *Summary model of variables predicting healthcare utilization (RQ 1).*

a: Predictor: (Constant), economic status, gender, health insurance status, education level.

b: Predictor: (Constant), economic status, gender, health insurance status, education level, age, GBMMS (12 items).

c: Dependent variable: healthcare utilization from the Medical Mistrust Index (5 items).

*Note. * = $p \leq .05$.*

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig
1a	Regression	.243	4	.061	.240	.915
	Residual	36.209	143	.253		
	Total	36.453	147			
2b	Regression	.287	6	.048	.187	.980
	Residual	36.16	141	.187		
	Total	36.45	147			

Table 5: *Multiple regression analysis of healthcare utilization (RQ 1).*

a: Predictor: (Constant), economic status, gender, health insurance status, education level.

b: Predictor: (Constant), economic status, gender, health insurance status, education level, age, GBMMS (12 items).

c: Dependent variable: healthcare utilization from the Medical Mistrust Index (5 items).

*Note. * = $p \leq .05$, *** = $p \leq .001$.*

The Pearson correlation coefficient between age and healthcare utilization was not significant (r = .032, p = .350). Likewise, the Pearson correlation coefficient between healthcare utilization and medical-mistrust was not significant (r = -.023, p = .389). Therefore, healthcare utilization does not appear to be affected by age or medical-mistrust level in the Black population. Thus, the null hypothesis failed rejection (R2change = 0).

Table 6 displays the coefficients associated with each model. None of the control variables significantly interacted with one another or the independent variables.

Research question 2 asked, what degree of medical-mistrust of healthcare providers and age predicts healthcare utilization in the Black population when controlling for education level, economic income, healthcare insurance status, and gender? Questions 1–10 and 12 from the GBMMS were used to answer research question 2. The results, in Table 7, indicate that medical-mistrust of healthcare providers and age did not influence healthcare utilization in the Black population. Healthcare provider mistrust accounted for an additional 12.2% variance in healthcare utilization among Blacks. The increase was not statistically significant (p = .123).

Model	Unstandardized		Standardized			95% Confidence Interval (B)	
	Coefficients		Coefficients				
	B	Std.Error	Beta	T	Sig.	Lower Bound	Upper Bound
1 (Constant)	1.28	.175		7.341	.000	.937	1.627
Economic Status	-.006	.037	-.019	-.173	.586	-.080	.067
Gender	.202	.099	.202	.206	.738	-.175	.216
Health Insurance Status	.029	.104	.024	.275	.932	-.177	.234
Education Level	.035	.041	.085	.863	.717	-.046	.117
2 (Constant)	1.24	.277		4.495	.000	.698	1.793
Economic Status	-.009	.038	-.028	-.246	.806	-.085	.066
Gender	.018	.101	.018	.176	.861	-.183	.219
Health Insurance Status	.030	.105	.075	.289	.773	-.177	.238
Education Level	.036	.042	.087	.860	.391	-.047	.120
Age	.025	.061	.035	.411	.681	-.095	.145
GBMMS	-.003	.081	-.003	-.035	.972	-.163	.157

Table 6: *Models 1 and 2 coefficient association within each model.*

a: Dependent variable: healthcare utilization from the Medical Mistrust Index (5 items).

*Note. * = p ≤.05, ** = p ≤ .001.*

Model	R	R2	Adj. R2	Std. Error		Change Statistics			
				of Est.	R2 Change	F Change	df1	df2	Sig. F Change
1a	.082	.007	-.021	.5032	.007	.240	4	143	.915
2b	.358	.128	.022	.4924	.122	1.525	12	131	.123

Table 7: *Summary model of variables predicting provider trust (RQ 2).*

a: Predictor: (Constant), economic status, gender, health insurance status, education level.

b: Predictor: (Constant), economic status, gender, health insurance status, education level, age, GBMMS (11 items).

c: Dependent variable: healthcare utilization the Medical Mistrust Index (5 items).

*Note. * = p ≤ .05, *** = p ≤ .001.*

Data (Table 8) confirmed that Model 2 was inclusive of the control variables and independent variables (age and medical-mistrust questions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 12) and did not significantly predict healthcare utilization in Blacks F (16,131) = 1.206, p = .271. Thus, the null hypothesis was not rejected (R2change = 0).

Research question 3 asked, the extent to which age and medical-mistrust of healthcare systems have on healthcare utilization in the Black population if education level, economic income, healthcare insurance status, and gender are controlled? Question 11 from the GBMMS survey was used to answer research question 3.

AVONA						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig**
1a	Regression	.243	4	.061	.240	.915
	Residual	36.209	143	.253		
	Total	36.453	147			
2b	Regression	4.681	16	.293	1.206	.271
	Residual	31.771	131	.243		
	Total	36.453	147			

Table 8: *Multiple regression analysis on provider trust (RQ 2).*

a: Predictor: (Constant), economic status, gender, health insurance status, education level.

b: Predictor: (Constant), economic status, gender, health insurance status, education level, age, GBMMS (11 items).

*c: Dependent variable: healthcare utilization from the Medical Mistrust Index (5 items). Note. * = p ≤ .05, *** = p ≤ .001.*

Data (Table 9) contains information about healthcare system trust and how age and medical-mistrust influenced healthcare utilization in the Black population.

Model	**R**	**R2**	**Adj. R2**	**Std. Error of Est.**	**R2Change**	**Change Statistics**			
						F Change	**df1**	**df2**	**Sig. F Change**
1a	.082	.007	-.021	.5032	.007	.240	4	143	.915
2b	.135	.018	-.023	.5037	.012	.834	2	141	.436

Table 9: *Summary model of variables predicting healthcare system trust (RQ 3).*

a: Predictor: (Constant), economic status, gender, health insurance status, education level.

b: Predictor: (Constant), economic status, gender, health insurance status, education level, age, GBMMS (1 item).

*c: Dependent variable: healthcare utilization from the Medical Mistrust Index (5 items). Note. * = p ≤ .05, *** = p ≤ .001.*

Healthcare system trust accounted for an additional 1.2 % of the change in healthcare utilization among Blacks. However, statistical significance was not achieved (p = .436). Further, none of the regression coefficients reached significance (Table 10).

Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig**
1a	Regression	.243	4	.061	.240	.915
	Residual	36.209	143	.253		
	Total	36.453	147			
2b	Regression	.667	6	.111	.438	.853
	Residual	35.786	141	.254		
	Total	36.453	147			

Table 10: *Multiple regression analysis on healthcare system trust (RQ 3).*

a: Predictor: (Constant), economic status, gender, health insurance status, education level.

b: Predictor: (Constant), economic status, gender, health insurance status, education level, age, GBMMS (1 item).

*c: Dependent variable: healthcare utilization from the Medical Mistrust Index (5 items). Note. * = p ≤ .05, *** = p ≤ .001.*

Model 2 of the regression coefficient model was not significant, F (6, 141) = .438, p = .853. Thus, the null hypothesis for research question 3 was not rejected (R2change = 0). Overall, the null hypotheses for research questions 1, 2, and 3 failed to be rejected.

Summary of the research results

Blacks seek healthcare at a lesser rate than other ethnic groups [23,24]. A gap in the literature exists on the level of medical-mistrust, according to age-stratification by the Black population and how it affects healthcare utilization. Thus, this study focused on determining if the level of medical-mistrust experienced among Blacks—according to age-stratification—affected this population's healthcare utilization.

This study involved a cross-sectional survey methodology design used to gather data. The sample was obtained through a purposeful quota of Black males and femaies. Recruits were parishioners from a predominately large Black (greater than 900 members) church in Orlando, Florida, USA. Participants age 18 and older were recruited. All participants accepted into the study received a consent form and three questionnaires (Demographics, Medical Mistrust Index, and Group-Based Medical Mistrust Scale). A hierarchical multiple regression analysis was used to interpret data for this quantitative experiment. The results of this study indicated that age and medical-mistrust levels did not affect healthcare utilization in the Black population.

Younger Black-American are growing up in a more accepting and inclusive society and are further removed from the events that spawned and perpetuated medical-mistrust by their older counterparts. Nevertheless, younger Black-Americans' medical-mistrust and healthcare utilization levels are consistent with other age groups in the Black population. This consistency among younger Black-Americans is a crucial finding as it validates that Black-Americans—across all age groups—need interventional mechanisms to lessen medical-mistrust and enhance healthcare-seeking behaviors. Hewins-Maroney., *et al*. (2005) explored psychosocial and socio-cultural aspects that shape healthcare-seeking behaviors within the Black community. The researchers showed that Black healthcare-seeking behaviors are similar to the general population once psychosocial and socio-cultural variables are eliminated across all age groups [25].

Limitations of the research

There were various limitations to this study. The information gathered from the small sample size of 148 participants cannot be definitively projected to a broader Black population. Likewise, the Black sample model, taken in Orlando, Florida, USA, may not represent the broader Black population, hindering external validity. The sample was collected at only one church in the City of Orlando, Florida, USA. There is the possibility that variety exists across different geographical locations.

No comparison was made between Black-Americans and other individuals of African descent living in America. Studies by Phelps., *et al*. (2001) and Kawachi., *et al*. (2005) indicated that some people of African descent from Caribbean countries and the continent of Africa living in America have different views on race relations than Black-Americans [26,27].

In general, people of African descent born outside of America have a more optimistic view of race relations than Blacks in America [26]. Accordingly, foreign-born individuals of African descent living in America could have been members of the church in which the sample was drawn. If so, it could have affected the final results, causing a shift in opinion to the less medical-mistrust category, which may not represent the larger Black population.

An individual interpretation of racism or prejudice in medical care fluctuates. There is no set standard or definition of a racist medical event. The burden of interpretation is on the individual who may or may not feel violated [28,29]. Individuals have different reasons for medical-mistrust and -distrust. Some medical-mistrust comes from experience, and other mistrust from avoidance (distrust).

There is no uniform cause of medical-mistrust that reaches across all aspects of Black-American life. Research by Soto., *et al.* (2011) indicated that many Blacks suffer from anxiety disorders. These generalized anxiety disorders contribute to the distrust of individuals or people. They cause an overall higher level of mistrust of others [30]. This study was unable to differentiate mistrust from distrust at the individual level. Thus, a more in-depth root cause analysis of why a person harbors medical-mistrust at the individual level was not reached.

Implications of the research findings

Blacks have fewer positive medical outcomes than Whites in the United States [6]. These health disparities' social implication results in an increase in morbidity for Blacks, perpetuating a higher mortality rate among Blacks [31]. Still, Blacks who seek healthcare are often lost during the following-up process due to disenfranchisement, cultural-mistrust, lack of minority healthcare professionals, and marginal access [32].

Healthcare injustices from the past (substandard treatments and unethical experiments and eugenics) have caused Blacks lower healthcare-seeking rates than other ethnic groups [33]. Older Blacks are more likely to have grown up in a segregated society where trust in the White medical community was not advantageous [34]. Yet, some younger Blacks hold a more negative attitude towards the past than the future [35]. This grounding of negative attitudes may be partly due to historical stories being passed down through generations about abuses towards Blacks [34,36,37].

Younger Blacks may tend to hold different time attitudes (life experiences in time) related to history and social interaction than older Blacks [35]. Thus, different engagement mechanisms may have to be used to motivate distinct segments of the Black population to seek medical care. It has been postulated that younger Blacks respond better to a system that evaluates and adapts motivation [38]. In contrast, older Blacks prefer relationship-building interactions to develop trust [39].

The results from this study indicate that Blacks across all age groups continue to harbor medical-mistrust that cannot be distinguished according to age. Thus, healthcare professionals and policymakers need to focus resources on all age demographics of the Black-American population related to medical disparities.

Social change is needed to eradicate disparities in healthcare-seeking behaviors among Black-Americans. The elimination of health disparities between other racial groups and Blacks-Americans could result in a financial benefit for all Americans [21]. For instance, in 2005, the United States spent 16% of the Gross National Product (GNP) or $1.98 trillion on healthcare [40]. The Joint Center for Political and Economic Studies (2009) estimated that all Americans' costs due to health disparities are approximately $413 billion annually [29]. Thus, changing the negative aspects of medical-mistrust and dire perceptions of healthcare by Black-Americans could result in better health status, less medical costs, and the needed social change to facilitate positive healthcare outcomes in Blacks [29,41].

Conclusion

Racial inequalities in healthcare are well documented in the literature. Historical injustices against Blacks have caused them to view healthcare as a menace to the well-being of individuals and the community [42]. Changing Blacks' views of medical care might be the answer to decreasing and eliminating health disparities in the United States. New healthcare policy changes and access, such as The Patient Protection and Affordable Care Act (2010), could close the gap in health disparities by providing greater access for all Americans

[43].

However, prior research has indicated that Blacks need greater interventional motivation to utilize healthcare [44]. Thus, healthcare access is only one variable in the health disparity formula. Cultural- and medical-mistrust among Black-Americans are dynamic factors, causing underutilization of healthcare [45-47]. Policy changes and greater access might improve but not eliminate health disparities [40,48,49].

This study aimed to find an intrinsic cause for the underutilization of healthcare by Black-Americans (that did not focus on access, policy, income, gender, or education level). Thus, age-related views on healthcare were used to explore attitudes regarding healthcare utilization by the Black-American community. The results of this study indicate that Black-Americans might not need distinct levels of intervention according to age. Younger Blacks (18–40) were just as likely to harbor medical-mistrust as other age-segments of the Black-American population. Motivational mechanisms may be needed at all age levels within the Black-American community to increase healthcare utilization.

Decreasing healthcare disparities affecting the Black community should include and engage: health literacy (understanding one's health status), access to quality healthcare, cultural competency, social understanding (healthcare professionals understanding past medical injustices that cause medical-mistrust), removing physical barriers (income and difficulty in scheduling appointments), and empowering Blacks (as healthcare consumers vested in trust and autonomy within the medical community) [43].

Further studies on Black-Americans' level of medical-mistrust and healthcare utilization are warranted. This study's small sample did not reveal a difference in how age affects medical-mistrust and healthcare utilization in Black-Americans. A more extensive study sample needs to be gathered to capture a broader range of participants [50] and provide different results. Future research should also include a broader range of Black-Americans from various geographic areas.

How an individual interprets prejudice or racism can be subjective [29]. Thus, future, in-depth research exploring the perceptions of racism by Black-Americans might reveal new aspects of distrust and mistrust [39].

According to Marshall (2005), a disproportionate number of Black-American men and women are affected by obesity and diabetes [51]. Paradoxically, as reported by Meis (2006), despite having higher rates of obesity, type 2 diabetes, and hypertension, Blacks have lower rates of metabolic syndrome (MetS) when compared to Caucasians [52]. Nevertheless, Black-Americans have a high risk for type 2 diabetes and a high rate of diabetic complications due to poor glycemic control and racial disparities in the U.S. healthcare system [51].

Thus, in the prevention, management, and treatment of type 2 diabetes, physicians and healthcare providers should be cognizant of and sensitive to the long-standing and persistent medical-mistrust embedded in the Black-American population's psyche—and how it discourages positive healthcare-seeking behaviors, resulting in increased cost to society. All medical professionals across the healthcare spectrum should respond accordingly.

Conflict of Interest Statement

The authors declare that this paper was written in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

Supplementary Information

The authors intend to publish several interdependent papers on this topic—this being the third of three publications. These research papers will be made available through E-Cronicon of the United Kingdom by the researchers and authors. This paper is based on prior doctoral research: Pruitt K.D. (2013). "Medical Mistrust According to Age in the Black Population" (unpublished doctoral dissertation). Walden University. Minneapolis, Minnesota, USA.

References

1. Pruitt KD and Kerna NA. "400 Years of Reasons: Medical-Mistrust in the Black-American Population (and Its Adverse Effects on Healthcare Outcomes and Increased Cost to Society)". *EC Emergency Medicine and Critical Care* 2020 Oct 15; 4.10.

2. Pruitt KD and Kerna NA. "Medical-Mistrust in the Black-American Population: Significance in Pediatrics and the Whole of Medicine". *EC Paediatrics* 2020 Oct 15; 9.10.

3. Thompson HS., *et al.* "The group-based medical mistrust scale: Psychometric properties and association with breast cancer screening". *Journal of Preventive Medicine* 38 (2004): 209-218. https://pubmed.ncbi.nlm.nih.gov/14715214/

4. Shelton RC., *et al.* "Validation of the group-based medical mistrust scale among urban Black men". *Journal of General Internal Medicine* 25.6 (2010): 549-555. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2869405/

5. Hughes-Halbert C., *et al.* "Racial differences in medical mistrust among men diagnosed with prostate cancer". *Cancer* 115 (2009): 2553-2561. https://pubmed.ncbi.nlm.nih.gov/19296516/

6. LaVeist TA., *et al.* "Attitudes about racism, medical mistrust, and satisfaction with care among African American and white cardiac patients". *Medical Care Research and Review* 57 (2000): 146-161. https://pubmed.ncbi.nlm.nih.gov/11092161/

7. Egede LE and Michel Y. "Medical mistrust, diabetes self-management, glycemic control in an indigent population with type 2 diabetes". *Diabetes Care* 29.1 (2006): 131-132. https://pubmed.ncbi.nlm.nih.gov/16373908/

8. Lillie-Blanton M., *et al.* "Race, ethnicity, and the health care system: Public perceptions and experiences". *Medical Care Research and Review* 57 (2000): 218-235. https://pubmed.ncbi.nlm.nih.gov/11092164/

9. Hammond WP. "Psychosocial correlates of medical mistrust among African American men". *American Journal of Community Psychology* 45 (2010): 87-106. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2910212/

10. Frankfort-Nachmias C and Nachmias D. "Research methods in the social sciences (7th edition.). New York, NY: Worth (2008). https://courses.lumenlearning.com/suny-hccc-research-methods/

11. Creswell J. "Research design: Qualitative, quantitative, and mixed methods approaches. Thousands Oaks, CA: SAGE (2009). https://us.sagepub.com/en-us/nam/research-design/book255675

12. Patton MQ. "Qualitative research and evaluation methods (3 edition.). Thousand Oaks, California: Sage Publications (2002). https://us.sagepub.com/en-us/nam/qualitative-research-evaluation-methods/book232962

13. Field A. "Discovering statistics using SPSS (3rd Ed.). Thousand Oaks, CA: SAGE (2009).

14. Green S and Salkind N. "Using spss for windows and macintosh: Analyzing and understanding data (6 ed.). Upper Saddle River, NJ: Pearson (2011).

15. Bell TJ and Tracey TG. "The relation of cultural mistrust and psychological health". *Journal of Multicultural Counseling and Development* 34 (2006): 2-14. https://www.researchgate.net/publication/264471298_The_Relation_of_Cultural_Mistrust_and_Psychological_Health

16. Montgomery DC., *et al.* "Introduction to linear regression analysis (3rd edition)". New York, NY: Wiley and Sons (2001).

17. U.S. Census Bureau, Statistical Abstract of the United States (2011).

18. Faul F., *et al.* "Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses". *Behavior Research Methods* 41.4 (2009): 1149-1160. https://link.springer.com/article/10.3758/BRM.41.4.1149

19. Urbaniak GC and Plous S. "Research Randomizer" (2011).

20. Brandon DT., *et al.* "The Legacy of Tuskegee and trusts and medical care: Is Tuskegee responsible for race differences in mistrust of medical care?" *Journal of the National Medical Association* 97.7 (2005): 951-956. https://pubmed.ncbi.nlm.nih.gov/16080664/

21. LaVeist TA., *et al.* "Mistrust of health care organizations is associated with underutilization of health services". *Health Services Research* 44.6 (2009): 2093-2105. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2796316/

22. Rudestam KE and Newton RR. "Surviving your dissertation: A comprehensive guide to content and process (3rd ed.). Thousand Oaks, CA: Sage (2007). https://us.sagepub.com/en-us/nam/surviving-your-dissertation/book239510

23. Bynum SA., *et al.* "Unwillingness to participate in colorectal cancer screening: Examining fears, attitudes, and medical mistrust in an ethnically diverse sample of adults 50 years and older". *American Journal of Health Promotion* 26.5 (2012): 295-300. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3807238/

24. Jupka KA., *et al.* "African American adults' experiences with the health care system: In their own words". *Journal of Health Disparities Research and Practice* 2.3 (2008): 17-32. https://digitalscholarship.unlv.edu/jhdrp/vol2/iss3/2/

25. Hewins-Maroney B., *et al.* "Health seeking behaviors of African-Americans: Implementation for health administration". *Journal of Health and Human Services Administration* (2005): 68-95. https://pubmed.ncbi.nlm.nih.gov/16521616/

26. Phelps RE., *et al.* "Cultural mistrust, ethnic identity, racial identity, and self-esteem among ethnically diverse Black university student". *Journal of Counseling and Development* 79.2 (2001): 209-216. https://www.researchgate.net/publication/263454680_Cultural_Mistrust_Ethnic_Identity_Racial_Identity_and_Self-Esteem_Among_Ethnically_Diverse_Black_University_Students

27. Kawachi I., *et al.* "Health disparities by race and class: Why both matter". *Health Affairs* 24.2 (2005): 343-352. https://www.healthaffairs.org/doi/full/10.1377/hlthaff.24.2.343

28. Collins TC., *et al.* "Racial differences in how patients perceive physician communication regarding cardiac testing". *Medical Care* 40.1 (2002): I-27-I-34. https://pubmed.ncbi.nlm.nih.gov/11789628/

29. Saha S., *et al.* "Trust in physicians and racial disparities in HIV care". *AIDS Patient Care and STD's* 24.7 (2010): 415-420. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3472674/

30. Soto JA., *et al.* "The relationship between perceived discrimination and generalized anxiety disorder among African-Americans, Afro-Caribbeans, and non-Hispanic Whites". *Journal of Anxiety Disorders* 25 (2011): 258-265. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3053120/

31. Braveman PA., *et al.* "Health disparities in health equity: The issue is justice". *American Journal of Public Health* 101.1 (2011): S149-S155. https://pubmed.ncbi.nlm.nih.gov/21551385/

32. Langford AT., *et al.* "Ethnic identity predicts loss-to-follow-up in a health promotion trial". *Contemporary Clinical Trials* 31 (2010): 414-418. https://pubmed.ncbi.nlm.nih.gov/20601162/

33. Braunstein JB., *et al.* "Race, medical researcher distrust, perceived harm, and the willingness to participate in cardiovascular prevention trials". *Medicine* 87.1 (2008): 1-9. https://pubmed.ncbi.nlm.nih.gov/18204365/

34. Byrd WM and Clayton LA. "An American health dilemma: Race, medicine, and health care in the United States 1900-2000". New York, NY: Routledge (2002).

35. Andretta JR., *et al.* "Demographic group differences in adolescents' time attitudes". *Journal of Adolescence* 36 (2013): 289-301. https://www.sciencedirect.com/science/article/abs/pii/S0140197112001698

36. Kunjufu J. "Countering the conspiracy to destroy Black boys". Chicago, IL: Afro-Am Publishing (1984).

37. Burrell T. "Brainwashed: Challenging the myth of Black inferiority". New York, NY: Smiley Books (2010).

38. Feldstein-Ewing SW., *et al.* "Two approaches to tailoring treatment for cultural minority adolescents". *Journal of Substance Abuse Treatment* 43 (2012): 190-203. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3371296/

39. Sewell K., *et al.* "Perceptions of and barriers to use of generic medications in a rural African American population, Alabama, 2011". *Preventing Chronic Disease* (2012): 9. https://pubmed.ncbi.nlm.nih.gov/22935144/

40. Feldstein PJ. "Health policy issues: An economic perspective (4th edition)". Chicago, IL: HAP (2007).

41. Gapenski LC. "Healthcare finance (4th edition)". Arlington, VA: AUPHA (2008).

42. Hausmann LR., *et al.* "Racial disparities in the monitoring of patients on chronic opioid therapy". *Pain* 154.1 (2013): 46-52. https://pubmed.ncbi.nlm.nih.gov/23273103/

43. Devi S. "Getting to the root of America's racial health inequalities". *The Lancet* 380 (2012): 1043-1044. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(12)61584-0/fulltext

44. Selden SC and Selden F. "Rethinking diversity in public organizations for the 21st century: Moving towards a multicultural model". *Administration and Society* 33.3 (2001): 303-329. https://www.researchgate.net/publication/240689843_Rethinking_Diversity_in_Public_Organizations_for_the_21st_Century_Moving_Toward_a_Multicultural_Model

45. Hughes-Halbert C., *et al.* "Differences in cultural beliefs and values among African-Americans and European-American man with prostate cancer". *Cancer Control* 14.3 (3): 277-284. https://journals.sagepub.com/doi/10.1177/107327480701400311

46. Terrell F and Terrell S. "Race of counselor, client sex, cultural mistrust level, and premature termination from counseling among Black clients". *Journal of Counseling Psychology* 31.3 (1984): 371-375. https://psycnet.apa.org/record/1984-29563-001

47. Wasserman J., *et al.* "Raising in the ivory tower: The production of knowledge and distrusts of medicine among African-Americans". *Journal of Medical Ethics* (2006): 177-180. https://pubmed.ncbi.nlm.nih.gov/17329393/

48. Dovidio JF., *et al.* "Disparities and distrust: The implications of psychological processes for understanding racial disparities in health and health care". *Social Science and Medicine* 67 (2008): 478-486. https://pubmed.ncbi.nlm.nih.gov/18508171/

49. Gaskin DJ., *et al.* "Examining racial and ethnic disparities in site of usual source of care". *Journal of the National Medical Association* 99.1 (2007): 22-30. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2569590/

50. Petrocelli JV. "Hierarchical multiple regression in counseling research: Common problems and possible remedies". *Measurement and Evaluation in Counseling and Development* 36.1 (2003): 9-22. https://www.tandfonline.com/doi/abs/10.1080/07481756.2003.12069076

51. Marshall MC Jr. "Diabetes in African Americans". *Postgraduate Medical Journal* 81.962 (2005): 734-740. https://pmj.bmj.com/content/81/962/734

52. Meis SB., *et al.* "Metabolic syndrome in nondiabetic, obese, first-degree relatives of African American patients with type 2 diabetes: African American triglycerides-HDL-C and insulin resistance paradox". *Ethnicity and Disease Autumn* 16.4 (2006): 830-836. https://pubmed.ncbi.nlm.nih.gov/17061734/

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