

RESEARCH ARTICLE

Multimorbidity and healthcare utilization among Black Americans: A cross-sectional study

Sangwoo Ahn  | Marissa Bartmess | Lisa C. Lindley

University of Tennessee College of Nursing,
Knoxville, Tennessee, USA

Correspondence

Sangwoo Ahn, University of Tennessee
College of Nursing, 1200 Volunteer Blvd.,
Knoxville, Tennessee 37996, USA.
Email: sahn7@utk.edu

Funding information

This research did not receive any specific
grant from funding agencies in the public,
commercial or not-for-profit sectors.

Abstract

Aim: Racial disparities between multimorbidity presence and healthcare utilization are present within the United States, but less is known about the relationship between multimorbidity presence and healthcare utilization among Black Americans. This study was conducted to examine the relationship between multimorbidity and healthcare utilization among Black Americans.

Design: Cross-sectional study.

Methods: This study ($n = 425$, 57% female) used adult level data from the 2012–2013 Connecticut Health Care Survey.

Results: Multivariate logistic regressions indicated that multimorbidity presence predicted a doctor and a specialist visit, but not a dentist visit.

Conclusion: This study identified multimorbidity presence as a predictor for healthcare utilization, but further research is necessary to understand healthcare utilization experiences among Black Americans with multimorbidity to assess the quality of care. Appropriate measures should also be considered to increase access to dental care for Black Americans with multimorbidity.

KEYWORDS

Black Americans, healthcare access, healthcare utilization, multimorbidity

1 | INTRODUCTION

Since the 1980s, the prevalence of chronic health conditions has steadily increased in the USA. Chronic diseases, such as heart disease, diabetes, chronic obstructive pulmonary disease, cancer and strokes, account for nearly 70% of deaths in the USA (King et al., 2018; Raghupathi & Raghupathi, 2018). In addition to the rising death rates associated with chronic diseases, public and private healthcare organizations have spent upwards of two trillion dollars to provide care for individuals with chronic diseases; this large increase in spending is partly due to the fact that chronic disease is rarely an isolated event (Raghupathi & Raghupathi, 2018). Having more than one chronic health condition is often referred to as multimorbidity.

2 | BACKGROUND

Multimorbidity, such as having heart disease, diabetes, hyperlipidaemia and/or oral conditions simultaneously, is often more prevalent among ethnic and racial minorities including Black Americans within the USA (Brown et al., 2018; Han, 2019; King et al., 2018; Wheeler & Bryant, 2017). It is known that Black Americans are often less likely to visit healthcare providers compared to non-Hispanic White individuals (Biener & Zuvekas, 2019; Carroll, 2020), in part because Black Americans are less likely to have adequate health insurance that could enable optimal healthcare utilization (Hawks et al., 2020). This could increase their incidence of chronic disease-related mortality in the USA (Noonan et al., 2016; Sohn, 2017).

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2021 The Authors. *Nursing Open* published by John Wiley & Sons Ltd.

However, less is known about health factors and their relationships with healthcare utilization among community-dwelling Black Americans. With increasing numbers of chronic disease and mortality noted among Black Americans (Connecticut Health Foundation, 2018), it is imperative to investigate Black Americans' health perceptions, abilities and needs to access healthcare services. By examining the association of multimorbidity presence and healthcare utilization, researchers and clinicians may gain a deeper understanding of healthcare issues among Black Americans. Therefore, the objectives of our study were to examine (1) the characteristics of pre-disposing, enabling and health need factors and (2) the relationship between multimorbidity and healthcare utilization among Black American adults, while controlling for pre-disposing, enabling and health need factors.

2.1 | Conceptual framework

The conceptual model was created with guidance from the Andersen Behavioral Model of Health as shown in Figure 1 (Andersen, 1995). The Andersen Behavioral Model of Health incorporates contextual and individual determinants of health to affect healthcare utilization. Thus, the underlying premise of the model is that healthcare utilization can be influenced by pre-disposing, enabling and health need factors (Babitsch et al., 2012). Pre-disposing factors include demographic characteristics such as gender, marital status and education level. Enabling factors are the organizational and/or financial conditions that help people utilize healthcare services such as health insurance, employment status and usual source of health care. Health need factors are based on people's perceived and evaluated health needs such as self-perception of health, body mass index and chronic diseases. Our study specifically sought to understand a health need

(multimorbidity) in relation to healthcare utilization among Black Americans. Multimorbidity was hypothesized to drive healthcare utilization, defined as doctor, specialist and dentist visits. Since other pre-disposing, enabling and health need factors are thought to affect healthcare utilization, they served as covariates in our study.

3 | METHODS

3.1 | Design and sample

A cross-sectional design was used to analyse data from the 2012–2013 Connecticut Health Care Survey (CHCS). The specific characteristics of the CHCS were introduced elsewhere (University of Massachusetts Medical School, 2014). Briefly, the CHCS was a telephone survey that was administered to residents to collect healthcare information in Connecticut. Individuals with access to either a landline or cellular phone were eligible for the CHCS.

The CHCS was sponsored and overseen by six foundations in Connecticut: Aetna, the Connecticut Health Foundation, the Patrick and Catherine Weldon Donoghue Medical Research Foundation, the University Health Care Foundation of Connecticut, the Foundation for Community Health, and the Children's Fund of Connecticut. The CHCS was modelled after other validated instruments, for example, the National Health Interview Survey. The survey team was trained and evaluated for competency in survey research. A random sampling technique was used that supports a more representative sample and reduces sampling bias (Polit & Beck, 2017). For this study, data from 425 Black American adults aged 18 years or older were included. Any American adults who did not identify themselves as Black Americans on the survey were excluded as well as any data for children. The survey collection period was between June 2012 and February 2013.

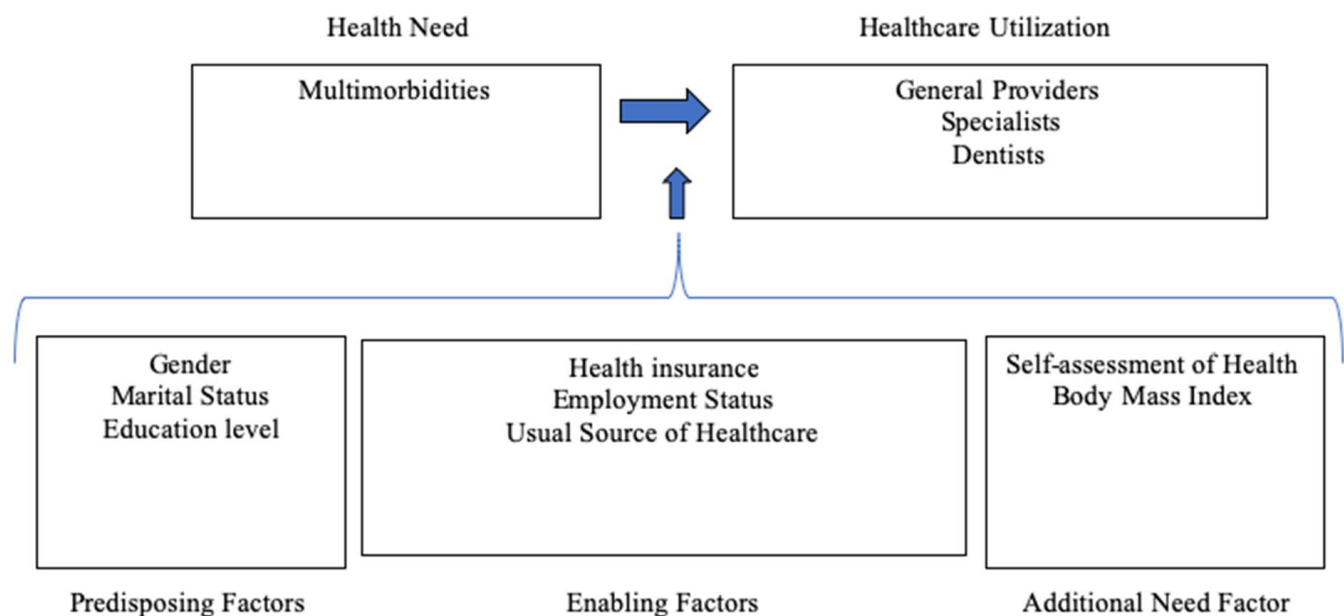


FIGURE 1 Conceptual model of relationship between multimorbidity and healthcare utilization

A post-hoc statistical G-power analysis was conducted to justify sample size (Faul et al., 2009). The effect size (0.75) for the G-power analysis was determined by a Nagelkerke R^2 of 0.42 from the final logistic regression model with nine predictors. With an alpha of 0.05, effect size of 0.75, nine predictors, and a sample size of 425, a statistical power of 1.00 was reached. It indicates that the final sample size of 425 is adequate to achieve enough statistical power while reducing the chance of Type 2 Errors.

3.2 | Ethics

The authors utilized a public use dataset that has been reviewed by IRB at the authors' institution. The authors did not merge or enhance the dataset in any way that could lead to the identification of study participants. Therefore, further review by the IRB was not required.

3.3 | Measures

In line with the Andersen (1995) Behavioral Model of Health, the outcome measure of interest (i.e. healthcare utilization) was operationalized by three separate variables (*doctor*, *specialist* and *dentist visits*). The measures of each healthcare utilization were derived from survey questions asking participants about a provider visit within the last 12 months of the time the survey was conducted (no/yes).

The predictor measure for our study was the presence of *multimorbidity* (no/yes), one of the health need factors. Participants of the CHCS were asked if they had ever been told by a healthcare professional that they had multiple chronic conditions. If they responded "yes" to this question, they were identified in our study as having multimorbidity.

The covariates represented pre-disposing (*gender* [male/female], *marital status* [married/unmarried], and *education level* [$<$ high school/ \geq high school]), enabling (*health insurance* [do you have health insurance? no/yes], *employment status* [are you employed? non-employed/employed], and *usual source of health care* [do you have usual source of health care? no/yes]), and health need factors (*self-assessment of health* [poor to fair/good to excellent] and *body mass index* [kg/m²]).

3.4 | Data analyses

Descriptive statistics were calculated for all covariates in terms of the whole sample and by multimorbidity. Categorical and continuous variables were described as percentages and means, respectively. For the categorical variables, a chi-square test was conducted to examine any difference of characteristic between participants with and without multimorbidity. Given that the data for the continuous variable of body mass index were skewed, a Mann-Whitney U test was used to assess a difference in body mass index by the multimorbidity presence. Multivariate logistic regression models were

used to determine whether the presence of multimorbidity predicts healthcare utilization while controlling for pre-disposing, enabling and health need factors. Three separate logistic regression models were created for the variables operationalizing healthcare utilization (i.e. doctor, specialist and dentist visits). The regression analyses results were presented as odds ratios (OR and 95% confidence interval [CI]). Survey weights were applied to all analyses to adjust for sampling bias. Assuming missing at random by missing value patterns (Langkamp et al., 2010), a mean imputation was used for the 24 missing observations of body mass index. After imputation, 31 cases including missingness were removed to apply for the list-wise deletion method (i.e. complete case analysis), resulting in a total of 425 individuals in our study. All data were analysed with IBM SPSS version 26.

4 | RESULTS

4.1 | Characteristics of the participants

Table 1 presented the sample characteristics and the comparison of the sample by multimorbidity based on the Anderson Behavioral Model of Health (Andersen, 1995). For pre-disposing factors, more than half of the participants were female (56.9%) and unmarried (65.1%) with at least a high school education (81.4%). For enabling factors, while the majority of participants had health insurance (84.7%) and a usual source of health care (86.3%), only 60.5% of participants were employed. For health need factors, most participants reported that they have a good to excellent health status (73.9%) while the mean BMI for the sample was 28.5 (overweight).

There were significant differences between Black Americans with and without multimorbidity. For pre-disposing factors, participants with multimorbidity were more often female (58.2% vs 56.3%), had less than a high school education (\geq high school; 68.4% vs 87.2%), and were unmarried (54.6% vs 69.8%) compared to their peers without multimorbidity. In terms of enabling health factors, less participants with multimorbidity were employed (48.4% vs 65.9%); however, participants with multimorbidity more often had health insurance (90.7% vs 82.1%) and a usual source of health care (90.2% vs 84.6%). There were also significant differences for health need factors between participants with and without multimorbidity. Fewer participants with multimorbidity reported having good to excellent health (52.8% vs 83.2%) and those with multimorbidity had a higher mean body mass index (32.3 vs 26.8).

4.2 | The relationship between multimorbidity and healthcare utilization

Table 2 represented results of three multivariate logistic regression models that assess the association between health factors (pre-disposing, enabling and need factors) and healthcare utilization. As an independent variable, the presence of multimorbidity

TABLE 1 Comparisons of Black Americans with and without multimorbidity (weighted, $n = 425$)

Health factors	All Black Americans ($n = 425$) % or mean	With multimorbidity ($n = 166$) % or mean	Without multimorbidity ($n = 259$) % or mean	p value
Pre-disposing				
Female	56.9%	58.2%	56.3%	<.001***
Unmarried	65.1%	54.6%	69.8%	<.001***
≥High school graduate education	81.4%	68.4%	87.2%	<.001***
Enabling				
Health insurance	84.7%	90.7%	82.1%	<.001***
Employed	60.5%	48.4%	65.9%	<.001***
Source of healthcare	86.3%	90.2%	84.6%	<.001***
Need				
Good to excellent health	73.9%	52.8%	83.2%	<.001***
Body mass index	28.5	32.3	26.8	<.001***

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; Body mass index presented as mean

TABLE 2 Associations between health factors and healthcare utilization (weighted, $n = 425$)

Health factors	Doctor visit OR (95% CI)	Specialist visit OR (95% CI)	Dentist visit OR (95% CI)
Multimorbidity	7.03 (2.35 – 21.01)***	5.11 (2.11 – 12.41)***	0.75 (0.37 – 1.55)
Pre-disposing			
Female	8.49 (3.08 – 23.41)***	1.38 (0.65 – 2.96)	0.77 (0.40 – 1.49)
Unmarried	0.77 (0.29 – 2.04)	1.09 (0.53 – 2.26)	1.29 (0.65 – 2.59)
≥High school graduate education	1.37 (0.40 – 4.74)	3.24 (1.12 – 9.43) *	1.84 (0.74 – 4.56)
Enabling			
Health insurance	11.24 (3.74 – 33.82)***	4.04 (1.54 – 10.61)**	3.09 (1.20 – 7.96) *
Employed	0.25 (0.09 – 0.69) **	1.14 (0.54 – 2.44)	1.70 (0.77 – 3.79)
Source of health care	11.55 (3.88 – 34.37)***	1.18 (0.47 – 3.02)	3.99 (1.51 – 10.60) **
Need			
Good to excellent health	0.74 (0.27 – 2.07)	1.01 (0.39 – 2.67)	0.79 (0.38 – 1.67)
Body mass index	0.97 (0.89 – 1.07)	1.06 (1.00 – 1.14) *	1.00 (0.96 – 1.06)

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Abbreviations: CI, confidence interval; OR, odds ratio.

was a significant predictor of healthcare utilization for doctor (OR 7.03; CI 2.35 – 21.01) and specialist (OR 5.11; CI 2.11 – 12.41) visits. Compared to Black Americans without multimorbidity, those with multimorbidity were over seven times more likely to visit a doctor within the past 12 months. Black Americans with multimorbidity were also over five times more likely to visit a specialist. However, the presence of multimorbidity was not associated with dentist visits.

Several covariates were related to healthcare utilization. Among the pre-disposing factors, being female was associated with more than 8 times higher odds of a doctor visit than being male (OR 8.49; CI 3.08 – 23.41). However, being female was not associated with a specialist or dentist visit. Marital status did not predict healthcare utilization (i.e. doctor, specialist, and dentist visits). Having a high school graduate education or higher predicted three times more specialist visits (OR 3.24; CI 1.12 – 9.43).

Enabling factors were also associated with healthcare utilization. Black Americans with health insurance were over 11 times (OR 11.24; CI 3.74 – 33.82), four times (OR 4.04; CI 1.54 – 10.61), and three times (OR 3.09; CI 1.20 – 7.96) more likely to visit a doctor, a specialist and a dentist within the past 12 months respectively. Although employment was a significant predictor, the odds of a doctor visit decreased by 75% for employed participants (OR 0.25; CI 0.09 – 0.69). Having a usual source of health care was not associated with a specialist visit. However, the odds for a doctor visit and a dentist visit for participants with a usual source of health care were 11.55 times (CI 3.88 – 34.37) and 3.99 times (CI 1.51 – 10.60) greater than participants without a usual source of healthcare, respectively.

Finally, among the health need factors, self-assessment of health was not associated with any type of healthcare utilization (i.e. doctor, specialist and dentist visits). However, higher body mass index increased the odds of specialist visits (OR 1.06; CI 1.00 – 1.14).

5 | DISCUSSION

Our study showed that the presence of multimorbidity among Black American adults was significantly associated with more healthcare utilization such as a doctor and a specialist visit when compared to Black Americans without multimorbidity. In addition, while being employed was associated with fewer doctor visits, being female, having health insurance, and having a usual source of health care predicted more doctor visits. Having health insurance also increased the odds of visiting specialists and dentists. Having a usual source of health care was associated with more dentist visits. Higher body mass index and educational levels predicted more specialist visits.

Contrary to other studies indicating Black Americans were less accessible to healthcare utilization (Noonan et al., 2016; Sohn, 2017), our study identified that Black Americans with multimorbidity are more likely to visit doctors (OR 7.03; CI 2.35 – 21.01) and specialists (OR 5.11; CI 2.11 – 12.41) after controlling for other health factors. However, our analyses did not compare Black Americans with multimorbidity to any other racial groups with multimorbidity, which was a factor of analysis in other studies (Noonan et al., 2016; Sohn, 2017). Our results are in line with those of Thompson and Saran (2016), which found that multimorbidity was a significant factor for increased healthcare utilization and costs. Generally, complex health needs (multimorbidity) can drive healthcare utilization (Schjøtz et al., 2017; Sommers et al., 2017; Wang et al., 2018). This is plausible because as the number of chronic conditions increases, health care becomes more complex and subsequently there is a higher need for healthcare services. Our finding that a higher body mass index was associated with more specialist visits (OR 1.06; CI 1.00 – 1.14) is also plausible given that a higher body mass index increases the likelihood of complex chronic conditions (Stumm et al., 2019; Tsiachristas et al., 2018). The results that Black Americans with multimorbidity were more likely to visit doctors or specialists could indicate that this population is able to access the health care they need compared to Black Americans without multimorbidity.

While Black Americans with multimorbidity in the present study were more likely to access health care, it is unknown what the quality of healthcare utilization is like and if it is sufficient to meet the needs of Black Americans or promote health. Black Americans have been shown to have higher rate of chronic disease yet receive substandard care compared to non-Hispanic White individuals (Bleich et al., 2019; Carroll, 2020). Moreover, although the morbidity causing the most health concerns may often be addressed adequately, other accompanying disorders could be overlooked. For example, prioritizing one morbidity over the others can contribute to inappropriate medication prescription between primary and secondary healthcare sectors (Schjøtz et al., 2017). Given that multimorbidity presence may not be holistically incorporated into patients' overall care, the results of our study support further investigations in holistic nursing and healthcare coordination to address multimorbidity care among Black Americans.

The presence of multimorbidity was not a significant predictor of a dentist visit; however, health insurance predicted a dentist visit and Black Americans with multimorbidity had a higher percentage of health insurance relative to their counterparts without multimorbidity (90.7% vs 82.1%). Given that poor dental health outcomes have been correlated with multimorbidity presence (Ide et al., 2018; Mejia-Lancheros et al., 2020), this finding may warrant further investigation. Private insurance from employers may offer dental insurance at an additional cost while Medicare and Medicaid do not cover any dental services for adults unless beneficiaries purchase supplemental coverage (Freed et al., 2019). In our study, dental coverage may not be accessible enough to Black Americans though employment. Additionally, the variable utilized in our study for health insurance did not specify health insurance type. Given that dental insurance status, income levels and concerns about dental costs have been identified as inhibiting factors for dental care (Vujicic et al., 2016), further research regarding the types of healthcare coverage and out-of-pocket expenses associated with dental services is necessary to better understand a potential health inequity among Black Americans.

In our study, a counterintuitive observation was being employed decreased the odds of seeing a doctor (OR 0.25; CI 0.09 – 0.69). Our finding suggests that Black Americans may not have enough time to see a doctor, which is consistent with a survey showing that the annual working hours have been increased by 12.4% over the past 30 years especially among Black American workers (Economic Policy Institute, 2017). Black Americans are also more likely to experience fears of being passed over for promotion compared to non-Hispanic White individuals and this fear could contribute to not taking time off work to visit a doctor (Bleich et al., 2019).

As indicated in previous studies (Sommers et al., 2017; Wang et al., 2018), our study showed that health insurance predicted all types of healthcare utilization, including doctor (OR 11.24; CI 3.74 – 33.82), specialist (OR 4.04; CI 1.54 – 10.61) and dentist visits (OR 3.09; CI 1.20 – 7.96). Healthcare utilization could improve health outcomes through increased rates of medication adherence, chronic disease management and annual health screenings (Sommers et al., 2017). In addition, our study showed that having a usual source of health care is a significant predictor for a doctor (OR 11.55; CI 3.88 – 34.37) and a dentist visit (OR 3.99; CI 1.51 – 10.62), but not for a specialist visit. This could be due to the nature of a specialist visit. Specialist care may not be considered a usual source of health care among study participants because this type of care is typically sought periodically through referrals from general providers. The dataset needs to clarify whether a usual source of care includes a regular specialist.

Our study comprehensively examined the characteristics of pre-disposing, enabling and health need factors as well as the association between multimorbidity and healthcare utilization among Black American adults using a validated data source. However, our study has limitations. First, although survey weights were applied to adjust for sampling bias, the sample may not be representative

enough to reflect the characteristics of all Black Americans within the USA. Second, our study could not include all potential covariates (e.g. health belief, social support and/or psychological distress) in the Andersen Behavioral Model of Health (Andersen, 1995) due to data availability. Third, we did not compare Black Americans to other racial and/or ethnic groups and it is possible that healthcare utilization among individuals with multimorbidity could differ by race and/or ethnicity.

5.1 | Implications

This study has implications for health services research. Although the presence of multimorbidity predicted healthcare utilization such as doctor and specialist visits among Black American adults, further research is necessary to better understand healthcare quality and whether multimorbidity is adequately treated among Black American adults in the USA. Qualitative research regarding Black American adults' experiences with healthcare utilization would be an important next step in assessing the quality of care. For example, based on their healthcare utilization experiences, nurses and clinicians may need to re-evaluate how they provide care by holistically reviewing each component of multimorbidity.

Our study has other implications for primary health care among Black Americans. Regarding the lack of association between multimorbidity and dental care identified in our study, we need to investigate the accessibility and types of dental coverage (e.g. via employer, self-pay, etc.) for Black Americans to determine where gaps in this type of coverage lie. Additionally, it is important to foster a workplace culture in which all persons have the time necessary to utilize healthcare resources and one where there is no disadvantage for taking time off work for healthcare utilization. However, until this workplace culture is fully realized, creating more accessible, equitable health care should be considered. For example, primary care services could be offered in non-traditional time frames and methods. Hosting some weekend and evening hours in addition to telehealth options may better address health needs of employed Black Americans.

6 | CONCLUSION

The presence of multimorbidity predicted a doctor and a specialist visit but did not predict a dentist visit among Black American adults. To improve the quality of care and provide the comprehensive care they need, further research is required to investigate healthcare utilization experiences among Black Americans with multimorbidity in the USA. Additionally, methods to increase access to dental care should be explored. Appropriate measures should be considered to increase access to primary health care for Black Americans based on their multimorbidity and employment status.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

AUTHOR CONTRIBUTIONS

Study design: Sangwoo Ahn, Marissa Bartmess, Lisa C. Lindley. Data collection: Lisa C. Lindley. Data analysis: Sangwoo Ahn, Marissa Bartmess. Manuscript writing: Sangwoo Ahn, Marissa Bartmess, Lisa C. Lindley.

DATA AVAILABILITY STATEMENT

The Connecticut Health Care Survey dataset used in this study is available in the ICPSR (Inter-University Consortium for Political and Social Science Research) repository, <https://www.icpsr.umich.edu/web/pages/>

ORCID

Sangwoo Ahn  <https://orcid.org/0000-0002-9492-4970>

REFERENCES

- Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36(1), 1–10. <https://doi.org/10.2307/2137284>
- Babitsch, B., Gohl, D., & von Lengerke, T. (2012). Re-revisiting Andersen's behavioral model of health services use: A systematic review of studies from 1998–2011. *Psycho-social Medicine*, 9, 1–15.
- Biener, A., & Zuvekas, S. (2019). Do racial and ethnic disparities in health care use vary with health? *Health Services Research*, 54(1), 64–74. <https://doi.org/10.1111/1475-6773.13087>
- Bleich, S. N., Findling, M. G., Casey, L. S., Blendon, R. J., Benson, J. M., SteelFisher, G. K., Sayde, J. M., & Miller, C. (2019). Discrimination in the United States: Experiences of Black Americans. *Health Services Research*, 54(6), 1399–1408. <https://doi.org/10.1111/1475-6773.13220>
- Brown, A., Liang, L., Vassar, S., Escarce, J., Merkin, S., Cheng, E., Richards, A., Seeman, T., & Longstreth, W. (2018). Trends in racial/ethnic and nativity disparities in cardiovascular health among adults without prevalent cardiovascular disease in the united states, 1988 to 2014. *Annals of Internal Medicine*, 168(8), 541–549. <https://doi.org/10.7326/M17-0996>
- Carroll, A. E. (2020). Health disparities among Black persons in the US and addressing racism in the health care system. *JAMA Health Forum*, 1(6), e200769. American Medical Association.
- Connecticut Health Foundation. (2018). *A snapshot of health disparities in Connecticut*. <https://www.cthealth.org/wp-content/uploads/2018/07/A-snapshot-of-health-disparities-in-Connecticut-2018.pdf>
- Economic Policy Institute. 2017. *Low-wage African American workers have increased annual work hours most since 1979*. <https://www.epi.org/blog/low-wage-african-american-workers-have-increased-annual-work-hours-most-since-1979/>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160.
- Freed, M., Potetz, L., Jacobson, G., & Neuman, T. (2019). *Policy options for improving dental coverage for people on medicare [Policy Brief]*. Kaiser Family Foundation. <https://www.kff.org/medicare/issue-brief/policy-options-for-improving-dental-coverage-for-people-on-medicare/>
- Han, C. (2019). Oral health disparities: Racial, language and nativity effects. *SSM - Population Health*, 8, 100436. <https://doi.org/10.1016/j.ssmph.2019.100436>

- Hawks, L., Himmelstein, D., Woolhandler, S., Bor, D., Gaffney, A., & McCormick, D. (2020). Trends in unmet need for physician and preventive services in the United States, 1998–2017. *JAMA Internal Medicine*, 180(3), 439–448. <https://doi.org/10.1001/jamainternmed.2019.6538>
- Ide, K., Seto, K., Usui, T., Tanaka, S., & Kawakami, K. (2018). Correlation between dental conditions and comorbidities in an elderly Japanese population: A cross-sectional study. *Medicine*, 97(24), e11075. <https://doi.org/10.1097/MD.00000000000011075>
- King, D. E., Xiang, J., & Pilkerton, C. S. (2018). Multimorbidity trends in United States adults, 1988–2014. *Journal of the American Board of Family Medicine*, 31(4), 503–513. <https://doi.org/10.3122/jabfm.2018.04.180008>
- Langkamp, D. L., Lehman, A., & Lemeshow, S. (2010). Techniques for handling missing data in secondary analyses of large surveys. *Academic Pediatrics*, 10(3), 205–210. <https://doi.org/10.1016/j.acap.2010.01.005>
- Mejia-Lancheros, C., Lachaud, J., Nisenbaum, R., Wang, A., Stergiopoulos, V., Hwang, S., & O'Campo, P. (2020). Dental problems and chronic diseases in mentally ill homeless adults: A cross-sectional study. *BMC Public Health*, 20(1), 419. <https://doi.org/10.1186/s12889-020-08499-7>
- Noonan, A. S., Velasco-Mondragon, H. E., & Wagner, F. A. (2016). Improving the health of Black Americans in the USA: An overdue opportunity for social justice. *Public Health Reviews*, 37(1), 12.
- Polit, D. F., & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for nursing practice* (10th ed.). Wolters Kluwer.
- Raghupathi, W., & Raghupathi, V. (2018). An empirical study of chronic diseases in the United States: A visual analytics approach. *International Journal of Environmental Research and Public Health*, 15(3), 431.
- Schiøtz, M. L., Høst, D., Christensen, M. B., Domínguez, H., Hamid, Y., Almind, M., Sørensen, K. L., Saxild, T., Holm, R. H., & Frølich, A. (2017). Quality of care for people with multimorbidity: A case series. *BMC Health Services Research*, 17(1), 745. <https://doi.org/10.1186/s12913-017-2724-z>
- Sohn, H. (2017). Racial and ethnic disparities in health insurance coverage: Dynamics of gaining and losing coverage over the life-course. *Population Research and Policy Review*, 36(2), 181–201. <https://doi.org/10.1007/s11113-016-9416-y>
- Sommers, B., Gawande, A., & Baicker, K. (2017). Health insurance coverage and health: What the recent evidence tells us. *The New England Journal of Medicine*, 377(6), 586–593. <https://doi.org/10.1056/NEJMs1706645>
- Stumm, J., Thierbach, C., Peter, L., Schnitzer, S., Dini, L., Heintze, C., & Döpfner, S. (2019). Coordination of care for multimorbid patients from the perspective of general practitioners: A qualitative study. *BMC Family Practice*, 20(1), 1–11. <https://doi.org/10.1186/s12875-019-1048-y>
- Thompson, A., & Saran, S. (2016). Multi-morbidity as a driver of high cost, high resource utilisation and future risk. *International Journal of Integrated Care*, 16(6), A243. <https://doi.org/10.5334/ijic.2791>
- Tsiachristas, A., van Ginneken, E., & Rijken, M. (2018). Tackling the challenge of multi-morbidity: Actions for health policy and research. *Health Policy*, 122(1), 1–3. <https://doi.org/10.1016/j.healthpol.2017.11.011>
- University of Massachusetts Medical School. (2014). Office of Survey Research. *Connecticut Health Care Survey, 2012-2013*. Inter-university Consortium for Political and Social Research. <https://doi.org/10.3886/ICPSR35475.v1>
- Vujicic, M., Buchmueller, T., & Klein, R. (2016). Dental care presents the highest level of financial barriers, compared to other types of health care services. *Health Affairs*, 35(12), 2176–2182. <https://doi.org/10.1377/hlthaff.2016.0800>
- Wang, Z., Li, X., Chen, M., & Si, L. (2018). Social health insurance, health-care utilization, and costs in middle-aged and elderly community-dwelling adults in China. *International Journal for Equity in Health*, 17(1), 1–13. <https://doi.org/10.1186/s12939-018-0733-0>
- Wheeler, S., & Bryant, A. (2017). Racial and ethnic disparities in health and health care. *Obstetrics and Gynecology Clinics of North America*, 44(1), 1–11. <https://doi.org/10.1016/j.ogc.2016.10.001>

How to cite this article: Ahn, S., Bartmess, M., & Lindley, L. C. (2022). Multimorbidity and healthcare utilization among Black Americans: A cross-sectional study. *Nursing Open*, 9, 959–965. <https://doi.org/10.1002/nop2.1095>