

Background

Diabetes mellitus (DM) is prevalent in rural US populations, many of whom face barriers to care. Patients with DM require frequent healthcare visits for disease management, yet little is known about how perceptions of provider respect influence visit frequency.

Methods

Using data from the All of Us Research Program, we included participants with a diabetes-related ICD-10 code who completed the SDOH survey. Perceived provider disrespect was measured by responses to "Health Advice: Respected by Provider" responses grouped into Respected by Provider and Not Respected by Provider were compared across self-reported visit frequencies with general doctors, specialists, mid-level providers, podiatrists, and eye doctors. Chi-square tests examined associations by provider type and race.

Results

Among 34, 143 participants with DM, non-White participants were more likely to report disrespect. Significant associations were observed overall for general, midlevel, specialist, and podiatry visits, while eye doctor visits showed no overall association. Racial differences were evident: Asian participants had the strongest associations, including for eye care, while Black and White participants showed significant associations primarily in general, midlevel, and specialist visits.

Conclusions

Perceived provider disrespect among patients with DM varies by race and provider type. Associations were strongest for general, midlevel, and specialist care, while eye care showed limited associations except among Asian participants. Interventions that improve communication and reduce stigma may enhance patient engagement in chronic disease management.

Diabetes mellitus (DM) presents a significant burden in rural U.S. communities, where prevalence is higher (14.3%) than in urban areas (11.6%).¹ DM is currently the eighth leading cause of death in the United States.² Individuals with DM require frequent healthcare visits for monitoring and specialist care, but access barriers, cost, and stigma may limit engagement. 89% of patients with type 2 DM are overweight or obese², and weight-related bias and negative provider interactions have been linked to reduced adherence, avoidance of care, and poorer outcomes.³ These experiences may be heightened in rural populations already facing structural challenges. Few studies have explored how rural patients with DM perceive respect across visit types and frequencies. The NIH All of Us database provides extensive data that can allow us to explore trends between health behaviors, demographics, and perceptions of care. This study aims to examine those perceptions, highlighting interpersonal and structural factors that may contribute to disengagement and inform strategies for improving rural diabetes care.

Methods

We conducted a cross-sectional analysis using data from the NIH All of Us Research Program, which collects health information from over one million U.S. participants to advance precision medicine and address disparities. Our study included participants with at least one diabetes-related ICD-10 code in their electronic health records and who completed the Social Determinants of Health (SDOH) survey launched in November 2021. The primary outcome was perceived discrimination in clinical care, measured using the Discrimination in Medical Settings (DMS) Scale, a validated seven-item, healthcare-specific adaptation of the Everyday Discrimination Scale. We focused on responses to the item, to "Health Advice: Respected by Provider" responses grouped into Respected by Provider and Not Respected by Provider. Healthcare utilization over the past 12 months was assessed via self-reported visits to general doctors, medical specialists (excluding OB/GYN, psychiatry, and ophthalmology), podiatrists, mid-level providers (nurse practitioners, physician assistants, midwives), and eye care providers (optometrists and ophthalmologists), with responses categorized by visit frequency. Demographic variables included self-reported race and ethnicity, grouped as White, African American, Asian, and Other/Multiracial. Chi-square analyses were performed to examine associations between perceived respect and healthcare utilization across provider types, as well as between racial/ethnic groups and perceptions of disrespect. The p-values were then transformed by $-\log_{10}$. The number most frequent healthcare visit location and the time from last healthcare interaction were analyzed as between the two groups of respected and not respected by their provider. All analyses were conducted within the All of Us Researcher Workbench using R version 4.4.0.

Chi-square analyses revealed significant racial and ethnic differences in healthcare utilization. Across the full sample, general doctor, midlevel provider, medical specialist, and podiatry visits showed strong variation, while eye doctor visits were largely consistent. When stratified, general and midlevel visits demonstrated the most consistent disparities across groups, with White participants showing the largest differences. Asian participants displayed a unique pattern, with variation in eye care utilization. We also saw that there is minimal difference between the most common healthcare visit location and time since last conversation with a healthcare professional no matter if you felt respected or not.

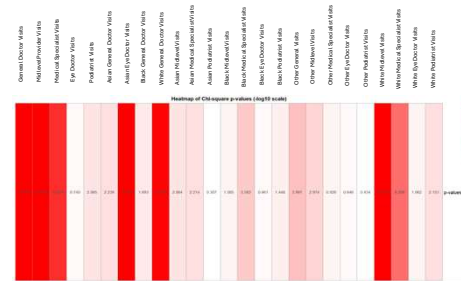


Figure 3. Heatmap of Chi-square p-values for differences in healthcare visits by provider type and patient demographics. The negative log10-transformed p-values from Chi-square tests assessing associations between visit frequency and patient demographic groups across various types of healthcare providers. Darker red shades indicate stronger evidence against the null hypothesis (smaller p-values), suggesting a significant difference in visit patterns, whereas lighter shades indicate weaker evidence (larger p-values, less significant).



Figure 1. This shows the most common healthcare location visit from respondents who said they were respected by their provider.

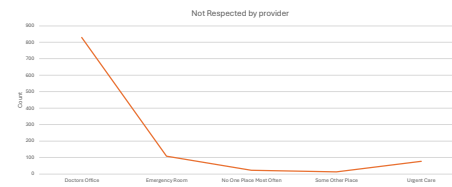


Figure 2. This shows the most common healthcare location visit from respondents who said they were not respected by their provider.

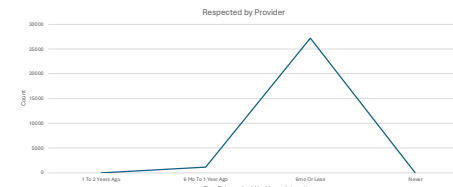


Figure 4. This shows the time between speaking to healthcare professionals from respondents who said they were respected by their provider.

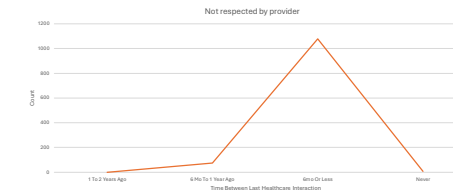


Figure 5. This shows the time between speaking to healthcare professionals from respondents who said they were not respected by their provider.

This study examined healthcare utilization patterns across provider types and racial/ethnic groups, as well as the relationship between perceived respect and patient engagement. Overall, significant variation was observed for general doctor, midlevel provider, and medical specialist visits, indicating that these services are particularly sensitive to individual, cultural, and systemic factors. Eye care utilization was largely consistent, except among Asian participants, who demonstrated markedly higher use, possibly reflecting cultural priorities or targeted community interventions. Stratified analyses revealed distinct patterns by race and ethnicity. Asian participants showed significant differences across general, midlevel, specialist, and eye care visits, while Black participants varied primarily in general, specialist, and podiatry visits. Participants in the "Other" category showed differences mainly in general and midlevel visits, whereas White participants exhibited significant variation across general, midlevel, specialist, and podiatry visits. These results highlight that healthcare utilization is not uniform and may reflect structural, cultural, or access-related factors.⁴ Perceived respect by providers also influenced engagement. Participants reporting disrespect were concentrated among recent healthcare users, particularly in doctors' offices and emergency rooms, suggesting that negative experiences may coincide with repeated or acute visits. In contrast, respectful interactions were associated with routine care, predominantly in doctors' offices, emphasizing the role of patient-provider relationships in promoting consistent care. These findings underscore the importance of culturally sensitive and respect in care.

1. Khavjou O, Tayebati Z, Cho P, Myers K, Zhang P. Rural-urban disparities in state-level diabetes prevalence among US adults, 2021. *Prev Chronic Dis.* 2025;22:240199. doi:10.5888/pcd22.240199
2. Centers for Disease Control and Prevention. Data & statistics on diabetes. CDC. Accessed June 17, 2025.
3. Drury CA, Louis M. Exploring the association between body weight, stigma of obesity, and health care avoidance. *J Am Acad Nurse Pract.* 2002;14(12):554-561. doi:10.1111/j.1745-7599.2002.tb00089.x
4. Hall WJ, Chapman MV, Lee KM, Merino YM, Thomas TW, Payne BK, Eng E, Day SH, Coyne-Beasley T. Implicit racial/ethnic bias among health care professionals and its influence on health care outcomes: a systematic review. *Am J Public Health.* 2015;105(12):e60-e76. doi:10.2105/AJPH.2015.302903

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