

Unraveling the Mediating Role of Frailty: Understanding Health Care Utilization among Older Sexual and Gender Minority Adults in the All of Us Research Program

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BACKGROUND

Older sexual and gender minorities (OSGM) have a higher burden of frailty¹ and mental health conditions² compared to non-SGM older adults (non-OSGM). Evidence from New York City suggests, OSGM are twice as likely to utilize mental health care compared to non-OSGM.³ Moreover, frailty among non-OSGM has been linked to higher utilization of health care, including general doctor visits, hospitalizations, and emergency department visits.^{4,5} However, the extent to which frailty impacts the relationship between OSGM status and health care utilization is poorly understood. Therefore, the aim of this study was to establish whether frailty acts as a mediator between sexual and gender minority (SGM) status and use of general doctor visits and mental health visits. Our hypothesis posits that individuals who are not frail will demonstrate a weaker positive association between OSGM status and healthcare utilization.

METHODS

Study Population

We examined survey data from the NIH-funded All of Us (AoU) Research Program, which aims to recruit a cohort of people historically underrepresented in biomedical research, including SGM.⁶ We used the AoU version 6 Controlled Tier dataset, which has undergone a series of data transformations to protect participant privacy and has been mapped to the Observational Medical Outcomes Partnership common data model. Participants included in the study were aged ≥ 50 years.

Measures

Exposure – OSGM status. Participants self-identified as SGM in “The Basics Survey” in questions about sex assigned at birth, gender identity, and sexual orientation. OSGM participants included those identified as sexual minorities: gay, lesbian, bisexual and those who are gender-diverse: transgender, non-binary, or additional options.

Outcome - Health care utilization. Health care utilization was measured in the “Health Care Access & Utilization” Survey. Two distinct outcomes were assessed, general doctor visits and mental health visits. Participants were asked “During the past 12 months have you seen or talked to a [general doctor] [mental health professional]?”; answers included “No” (recoded as “0 visits”) and “Yes.” Those answering yes were asked, “What is the total number of [general doctor] [mental health professional] visits you made in the last 12 months?” with 8 possible responses (1, 2-3, 4-5, 6-7, 8-9, 10-12, 13-15, 16+).

Hypothesized mediator - Frailty. Frailty was measured using the All of Us deficit accumulation Frailty Index¹ which consists of 33 deficits derived from survey questions which assessed 7 domains of health. The AoU-FI ranges from 0 – 1, with higher scores indicating greater frailty.

Covariates. Baseline covariates included age, race/ethnicity, and income; HIV and marital status were included as confounders affected by the exposure. For the mental health visit outcome (Figure 1b below), general mental health was also included as a covariate affected by the exposure.

Statistical Analysis

A marginal structural model approach was used to study the mediating role of frailty in the association between SGM status and health care utilization while adjusting for baseline and exposure mediated covariates detailed above (Figure 1). This approach uses inverse probability of treatment weighting (IPTW) to balance SGM status, frailty, and visits as well as baseline and exposure covariates described above. This allows for simulation and imputation of the counterfactual values of the mediator (Robust vs Frail). The total effect represents the overall impact of SGM status on health care utilization, while the controlled direct effect estimates the direct effect between SGM status and health care utilization while controlling for frailty. Non-parametric bootstrapping (50 times) was used to estimate 95% CI and P values with alpha=0.05. Statistical analyses were performed using statistical software R (v4.2.2) with the CMAverse package on the AoU researcher workbench.

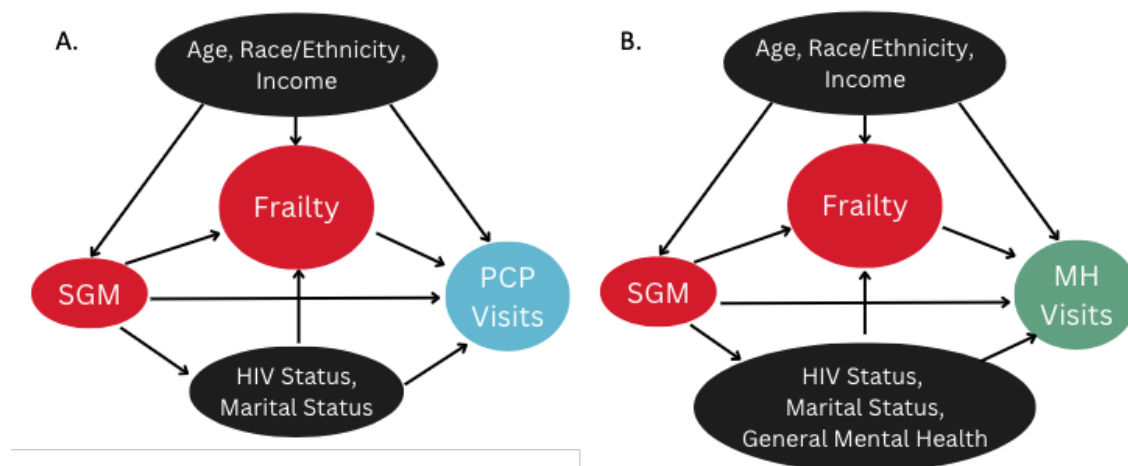


Figure 1. DAG for general doctor (PCP) visits in blue (A) and mental health (MH) visits in green (B). Covariates in black, please note general mental health is added as a covariate for the outcome of mental health visits.

RESULTS

OSGM (n=4,763) compared to non-OSGM (n=68,146) were younger (mean [SD], 63 [8] vs 66 [8]), with higher frailty (26% frail vs 19% frail), similar proportion having insurance (96% vs 97%), fewer reporting excellent mental health (23.2% vs 30.2%), and more reporting delays in health care (30% vs 24%). The proportion of general doctor and mental health visits for each visit category are presented in Figure 2.

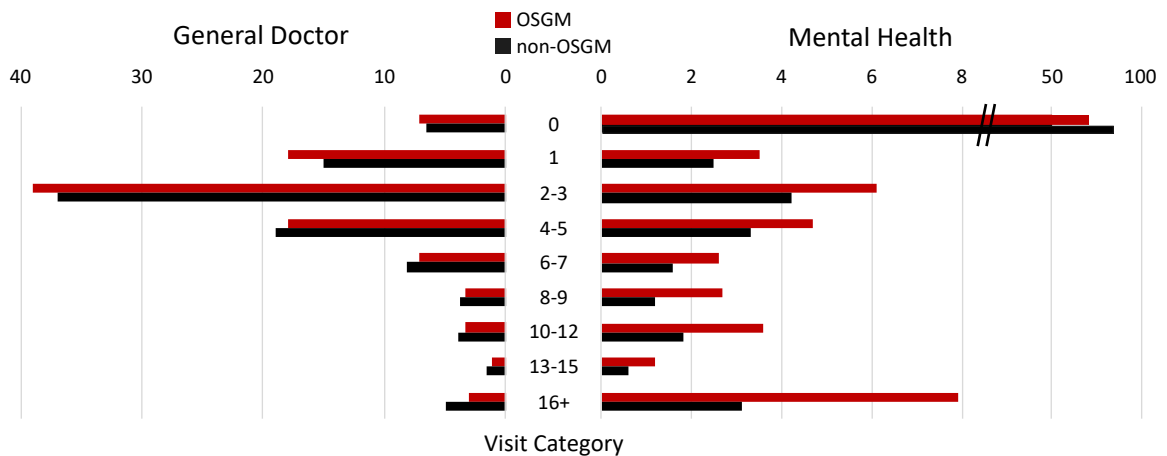


Figure 2. Self-report general doctor (Left) and mental health (Right) visit categories in the past 12 months by older sexual and gender minority adults (OSGM, n=4,736, red) and older cisgender heterosexual adults (non-OSGM, n=68,146, black). Please note the visit proportion axis scale is different for each visit type.

For general doctor visits, the mediation analyses demonstrated that the OSGM total effect was 1.11 (1.07, 1.14) times the rate of general doctor visits adjusting for baseline covariates of age, race/ethnicity, income, and exposure associated covariates of HIV and marital status. The controlled direct effect was 1.11 (1.06, 1.17) suggesting that rate of general doctor visits among OSGM would remain similar if the population were robust.

Similar results were found for mental health visits as the OSGM total effect was 1.88 (1.70, 2.07) times the rate of general doctor visits adjusting for baseline covariates of age, race/ethnicity, income, and exposure associated covariates of HIV, marital status, and general mental health. Whereas controlled direct effect is 1.73 (1.40, 2.24) suggesting that rate of mental health visits among OSGM would remain similar if the population robust.

CONCLUSION

Our findings were contrary to our hypothesis that robust OSGM would demonstrate decreased health care utilization compared to frail OSGM, such that we found that being robust did not impact the number of general doctor visits or mental health visits for OSGM. Our findings suggest that factors other than frailty may be influencing the pattern of health care utilization. Further, our findings also support that OSGM have twice the rate of mental health visits compared to non-

OSGM. Future work should examine the consensus between survey and EHR reported health care utilization within All of Us to further support our findings. Additionally, the possibility of volunteer bias should be examined as OSGM participating in All of Us may be different from other OSGM, perhaps more comfortable seeing providers since it is part of the enrollment process.

References

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