

Demographic Analysis and Incidence of Chronic Sinusitis Symptoms in a Nationwide Sample of US Adults with a History of Facial Trauma

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INTRODUCTION

Nasal bone fractures are the most common maxillofacial injuries, largely due to the prominent facial position of the nose. While there is extensive literature discussing the acute treatment and management of nasal and septal fractures (often requiring urgent intervention ranging from manual realignment to surgery) there is limited information on the prevalence and nature of chronic sinonasal symptoms following facial injuries including broken nose. Furthermore, the demographics of individuals with such injuries have not been thoroughly examined.

METHODS

This cross-sectional epidemiologic analysis utilized data from the 2013–2014 National Health and Nutrition Examination Survey (NHANES). A total of 3,815 adults were included, of whom 3,700 provided complete data on smell and taste function as well as sinonasal symptom reporting. Key exposure variables included self-reported history of nasal fracture or serious facial/skull injury. Outcomes of interest were chronic sinonasal symptoms, including nasal blockage, sinus pain, and runny nose, as well as a composite measure of any chronic sinusitis symptom. Additional covariates included demographic characteristics (age, sex, race/ethnicity, marital status, education, and income) and smoking status.

All analyses incorporated the complex NHANES survey design to ensure nationally representative estimates of the U.S. adult population. Specifically, 2-year interview sampling weights (WTINT2YR), strata (SDMVSTRA), and primary sampling units (SDMVPSU) were applied per NHANES analytic guidelines. Weighted prevalence estimates with 95% confidence intervals were calculated for trauma history and sinonasal symptoms overall and across demographic subgroups. Logistic regression models were estimated using survey design–correct methods to obtain odds ratios (OR) and design-adjusted standard errors for the association between facial trauma and chronic sinonasal outcomes.

RESULTS – CHRONIC SINONASAL SYMPTOMS AND FACIAL TRAUMA

Among 3,700 adults with complete data, the weighted prevalence of prior facial trauma was 17.2%, representing millions of U.S. adults. The weighted prevalence of sinonasal symptoms was 7.6% for nasal blockage, 3.2% for sinus pain, and 11.8% for runny nose, with 18.7% reporting any chronic sinonasal symptom. Individuals with trauma history had higher prevalence of these outcomes compared to those without. In logistic regression models accounting for survey design, trauma was associated with a significantly increased likelihood of runny nose (OR = 1.78, 95% CI: 1.48–2.10, $p < 0.001$). Associations with sinus pain (OR = 1.48, 95% CI: 0.98–1.98, $p = 0.13$), runny nose (OR = 0.95, 95% CI: 0.41–2.22, $p = 0.12$), were not statistically significant. However, having any sinonasal symptoms with facial trauma was also a strong association. (OR = 1.50, 95% CI: 1.29–1.73).

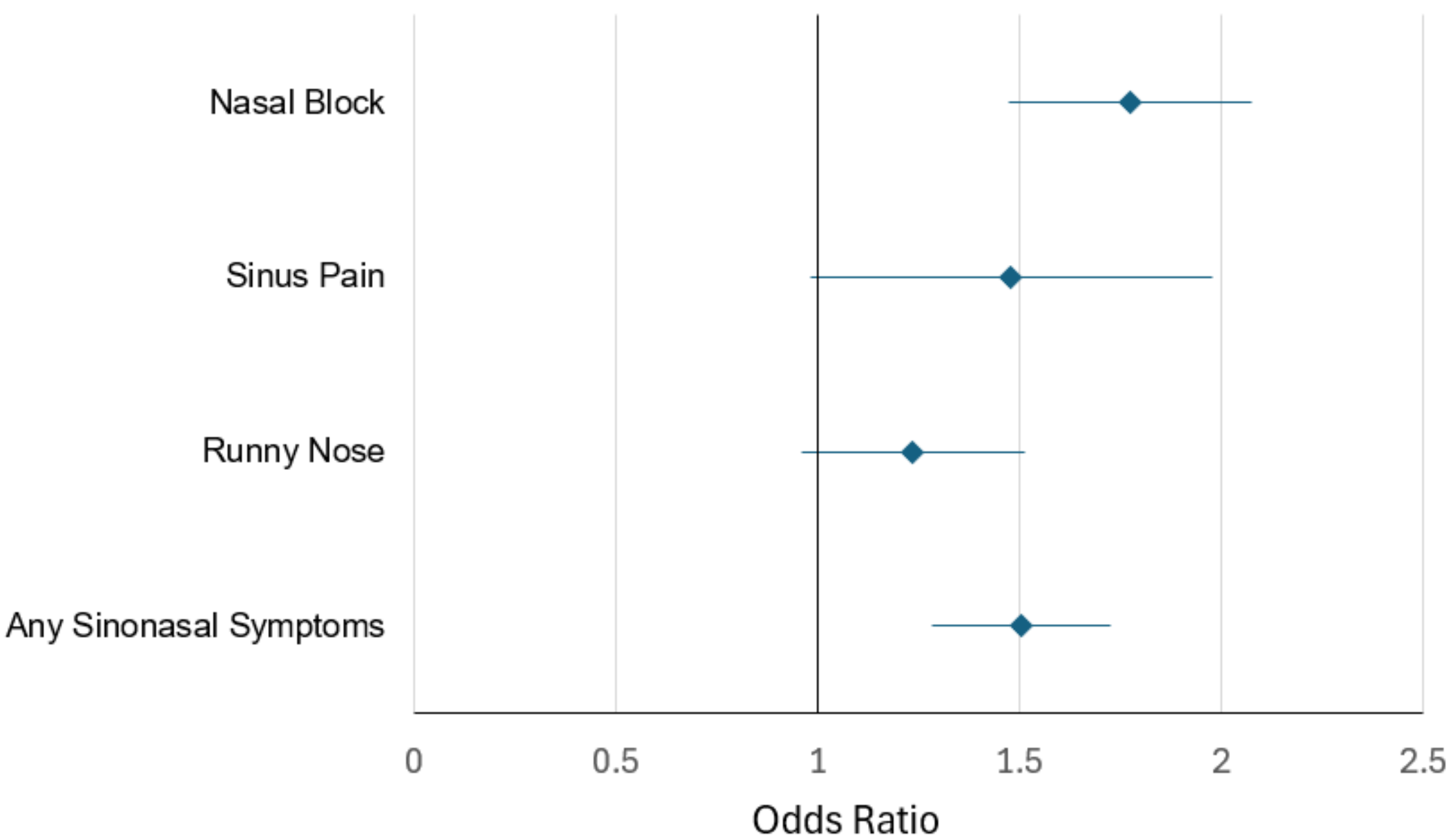


Figure 1. Odds of sinonasal outcomes are higher in adults with a history of facial trauma (NHANES 2013–2014).

RESULTS – DEMOGRAPHIC ANALYSIS

Subgroup analysis showed facial trauma prevalence was highest among Non-Hispanic White adults (20.3%) and current smokers (21.1%), compared with 13.8% in non-smokers and 7.9% in Non-Hispanic Black adults, even accounting for 95% confidence intervals. These findings highlight minor disparities in facial trauma incidence.

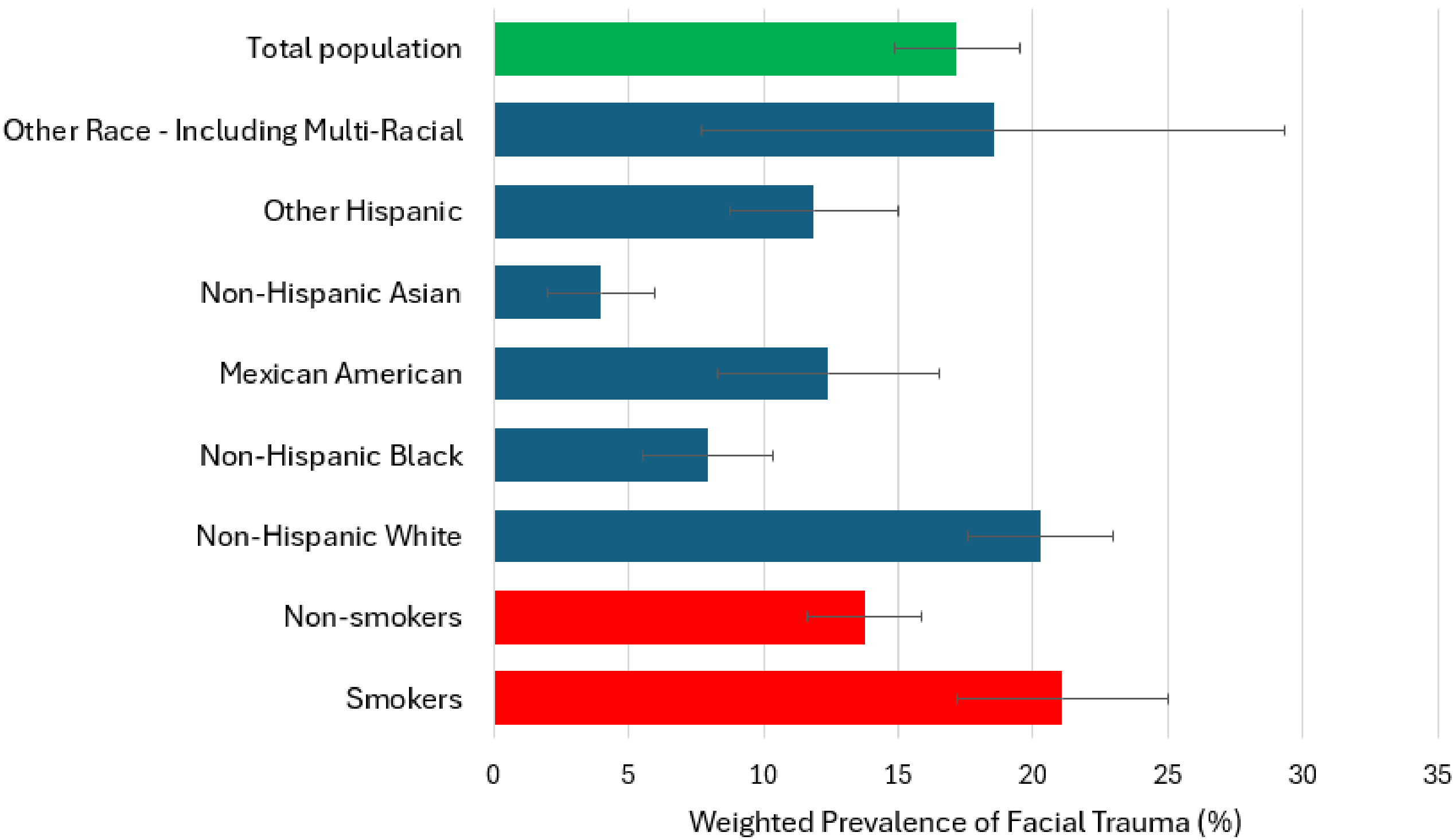


Figure 2. Facial trauma prevalence by subgroup, showing higher rates among smokers and Non-Hispanic White adults (NHANES 2013–2014).

CONCLUSIONS

Facial trauma is common in the U.S. adult population and disproportionately affects smokers and Non-Hispanic White adults. Trauma history was significantly associated with chronic nasal blockage, highlighting a potential long-term consequence of facial injury. Other sinonasal symptoms, including sinus pain and runny nose, and physician-diagnosed chronic sinusitis, showed weaker associations. **These findings suggest that clinicians should consider facial trauma history when evaluating patients with persistent nasal obstruction, and that preventive strategies may help reduce long-term sinonasal morbidity.**

FUTURE DIRECTIONS

Further research should explore the mechanisms linking facial trauma to chronic nasal obstruction, including structural changes and mucosal remodeling. Longitudinal studies are needed to clarify causality and identify patients at highest risk for persistent symptoms. Expanding analyses across multiple NHANES cycles or clinical cohorts could improve precision and assess trends over time. Ultimately, integrating trauma history into screening and prevention strategies may help reduce the burden of chronic sinonasal disease.

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