Demographic Trends of Annual Dental Visits by Adults (ages 18+) in Virginia, 2020

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Abstract

Access to oral healthcare is impacted by determinants such as socioeconomic status, race, and geographic conditions. Disparities in oral healthcare and equity affect the oral health and overall wellbeing of disadvantaged groups. This study aims to determine the demographic trends of annual dental visits by adults (ages 18+) in Virginia during the 2020 calendar year. A secondary analysis was performed using data from the National Oral Health Surveillance System (NOHSS) adult indicators survey. After manually screening for 2020 data in Virginia adults, 9446 individuals were examined. This data was analyzed using chi-square tests of independence for statistically significant associations between demographic factors and dental care access in Virginia adults. Chi-square tests of independence showed statistically significant evidence that demographic status (age, education, gender, income, race) and participation in annual dental care are not independent. Demographic factors like age, education level, gender, income, and race influence annual dental visitation rates across Virginia. Education, race, and income are significant factors impacting annual dental visit variations among different demographic groups in Virginia. Annual dental visits are mostly for preventive dental care. Research shows preventive dental care reduces nonpreventive dental visits and expenditures. Therefore, understanding the demographic trends in annual dental visits across Virginia can help to put in place interventions to improve the number of adults going for annual dental checkups.

Introduction/Background

Access to oral healthcare is impacted by determinants such as socioeconomic status, race, and geographic conditions. Disadvantaged populations' oral health and general well-being are impacted by disparities in dental healthcare and equity. The determinant such as education provides a systematic quantification of inequalities present within the access to oral healthcare. Education and economic positions are interlinked, which lower positioning in socioeconomic standards presents a lower awareness of oral health and insurance coverage.[1] Racial-ethnic disparities have persisted despite research, programmatic and policy interventions aimed to eliminate them. Several studies report that racial-ethnic minorities, particularly Blacks, experience disproportionately more oral health problems and these disparities increase with age.[2] Studies among older Americans found that not only Black Americans have greater number of decayed and missing teeth on average, but the disparities in missing teeth have increased between Black and White Americans. Income status remains a major contributing factor to dental care accessibility. Studies have found that there is decreased dental accessibility from people of low socioeconomic statuses. Financial barriers to dental care are the most frequently cited reasons by adults for not getting the dental care services needed.[3] The aim of this study is to ascertain the differences between different demographics in their oral care. This is a secondary study with a data set from the CDC on adults' dental care in Virginia in 2020. Understanding and addressing these disparities is essential for promoting oral health equity and ensuring that all adults in Virginia have access to quality dental care.

Methods

The data used in this study was originally collected from the Behavioral Risk Factor Surveillance System (BRFSS), a nationwide system of health-related telephone surveys. This data was exported from the Center for Disease Control and Prevention (CDC) data repository, data.cdc.gov. The data from BRFSS for the indicators of adult oral health for the years 2012-2020 represented the median prevalence among the 50 states in the United States. A secondary analysis was performed using the National Oral Health Surveillance System (NOHSS) adult indicators survey data, a sub-category of the BRFSS. To assess the most current data available, manual screening was performed to select data from 2020. From these narrowed results, only participants who were Virginia residents aged 18 years or older were included in this analysis to reflect the population of interest, resulting in 9,446 individuals. Using Microsoft Excel, individuals were categorized and coded into demographic groups of age, education, sex, income, and race. This data was then analyzed using pairwise chi-square tests of independence among each group to determine statistically significant associations between the demographic factors and dental care access in Virginia, with a significance level of 5%.

Table 1. Results of data analysis using chi-square test of independence

Demographic	df	N	x^2	p-value
Age	5	9446	75.062	<0.001
Education	3	9411	754.715	<0.001
Gender	1	9446	15.470	<0.001
Income	4	7732	742.675	<0.001
Race	4	9207	128.277	<0.001

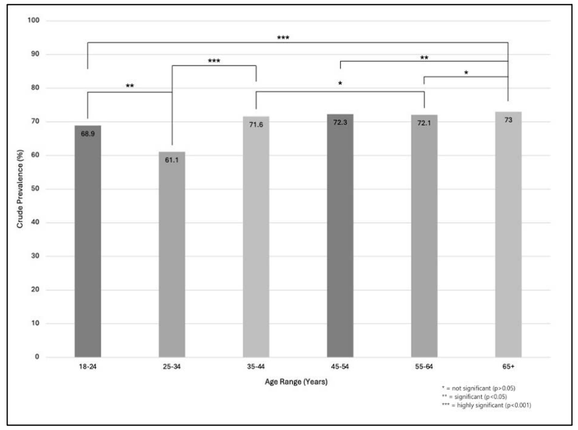

Figure 1. Adults aged 18+ who have visited a dentist or dental clinic in the past year by age category, Virginia, 2020 *x^2 (5, N = 9446) = 75.062, p = <0.001

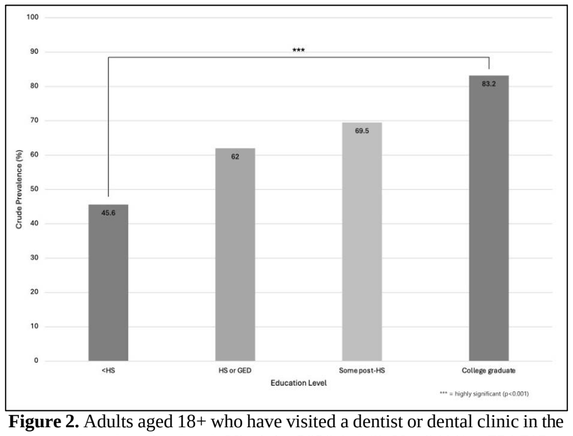

Figure 2. Adults aged 18+ who have visited a dentist or dental clinic in the past year by education level, Virginia, 2020 *x^2 (3, N = 9411) = 754.715, p = <0.001

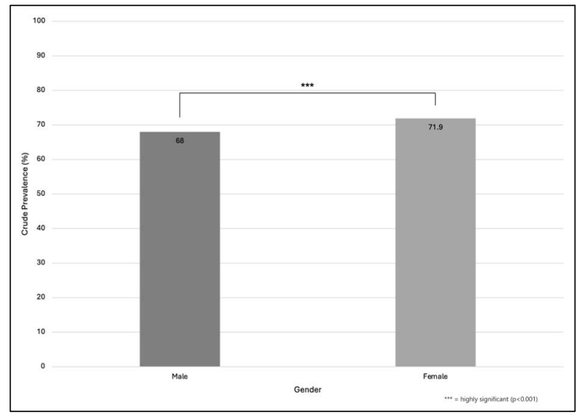

Figure 3. Adults aged 18+ who have visited a dentist or dental clinic in the past year by gender, Virginia, 2020 *x^2 (1, N = 9446) = 15.470, p = <0.001

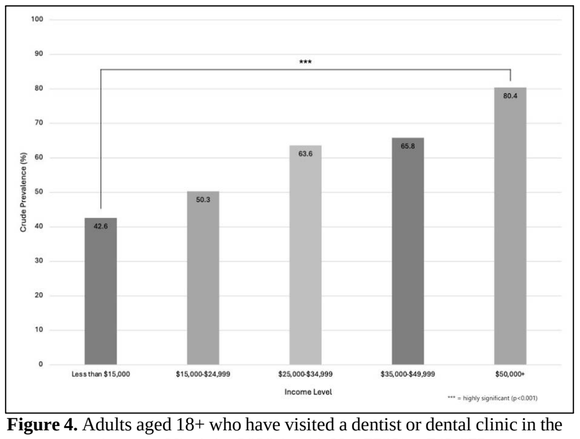

Figure 4. Adults aged 18+ who have visited a dentist or dental clinic in the past year by income, Virginia, 2020 *x^2 (4, N = 7732) = 742.675, p = <0.001

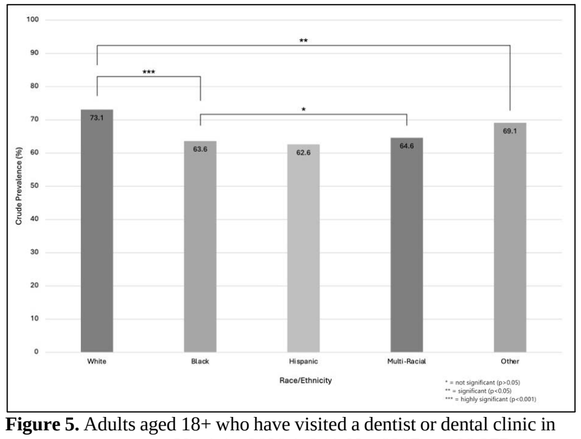

Figure 5. Adults aged 18+ who have visited a dentist or dental clinic in the past year by race, Virginia, 2020 *x^2 (4, N = 9207) = 128.277, p = <0.001

Results, Discussion, and Conclusion

Results

Chi-square tests of independence at α = 0.05 showed statistically significant evidence that demographic status (age, education, gender, income, race) and participation in annual dental care are not independent [p = <0.001 for age (N = 9446), education (N = 9411), gender (N = 9446), income (N = 7732), and race (N = 9207)], indicating an association between these demographic factors and annual dental care (Table 1, Figures 1-5).

Minority races were not significantly different from each other. White race was significantly different from other races. Not completing high school compared to college graduate had the largest x^2 value by far (589.612), which shows that it is the strongest predictor of annual access to dental care. While age is significant, it's significance is largely due to the 25-34 year-old group.

Discussion

There is evidence linking oral health to general health, and knowledge of the risk factors linked to disparities in oral health can help identify the needs of a population in terms of health services. Frequent dental cleaning have been linked to fewer dental operative procedures especially in children.[4] Dental care among low–income adults continue to be low across racial and ethnic groups.[5] This study investigated the relationships between the number of yearly dental visits and demographic variables like age, sex, education level, and income to better understand these risk factors. These variables are very important when discussing yearly dental visits as strong influences have been noted between the variables and yearly dental visits. Improving dental service utilization is a critical first step in resolving disparities in oral health in the United States.

Conclusion

Demographic factors like age, education level, gender, income, and race influence annual dental visitation rates across Virginia. Education, race, and income are the main causes of annual dental visit variations among different demographic groups in Virginia. Annual dental visits are mostly for preventive dental care. Research shows preventive dental care reduces non-preventive dental visits and expenditures. Therefore, understanding the demographic trends in annual dental visits across Virginia can help to put in place interventions to improve the number of adults going for annual dental checkups.

Limitations

- The inability to assess cause-and-effect relationships from this type of study.
- The methods used by the original researchers to calculate crude prevalence were not known.

Future Work

- Explore the nature and extent of this relationship, which could shed light on important factors that affect dental health outcomes in diverse populations.
- This study will serve as the basis for our upcoming research, which the Liberty University Public Health Student Association (LUPHSA) research committee will present during research week next year. "Increasing dental healthcare services among the international students at Liberty University" will be the topic of the research. This will be expansive research to determine the barriers international students encounter when accessing dental care as well as fostering partnerships, implementing interventions, and publicizing our findings.

References

1. Reda SF, Reda SM, Thomson WM, Schwendicke F. Inequality in utilization of dental services: a systematic review and meta-analysis. *Am J Public Health*. 2018;108(2):e1-e7. doi: 10.2105/AJPH.2017.304180.
2. Song J, Tomar S, Duncan RP, Fogarty K, Johns T, Kim JN. The health care utilization model: application to dental care use for Black and Hispanic children. *J Public Health Dent.* 2021;81(3):188-197. doi:10.1111/jphd.12430
3. Northridge ME, Kumar A, Kaur R. Disparities in access to oral health care. *Annu Rev Public Health*. 2020;41(1):513-535. doi:10.1146/annurev-publhealth-040119-094318
4. Wehby GL, Lyu W, Shane D. Racial and ethnic disparities in dental services use declined after Medicaid adult dental coverage expansions. *Health Aff (Millwood)*. 2022;41(1):44-52. doi:10.1377/hlthaff.2021.01191
5. Hung M, Licari FW, Lipsky MS, et al. Early preventive dental visits: do they reduce future operative treatments? *Dent J (Basel).* 2022;10(4):53. doi:10.3390/dj10040053