



Research Article

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Dental Pain and Self-Rated General Health Among Adults in the United States: A Cross-Sectional Analysis of NHANES 2017-2018

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Abstract

Background: Oral health is a critical component of overall well-being, yet the association between specific oral symptoms like mouth pain and general health status is not fully characterized in a nationally representative population. **Objective:** This study aimed to investigate the relationship between self-reported mouth pain and general health status among US adults using data from the National Health and Nutrition Examination Survey (NHANES) 2017-2018. **Methods:** A cross-sectional analysis was conducted on 4,110 adults aged 30 years and older. The exposure was the frequency of mouth pain (often, occasionally, hardly ever, never). The outcome was self-reported general health status (excellent, very good, good, fair, poor). Multivariable cumulative logistic regression models were used to estimate odds ratios (ORs) and adjusted odds ratios (aORs) for the cumulative odds of reporting poorer health. Model 1 was unadjusted; Model 2 adjusted for sociodemographic factors (age, gender, race/ethnicity, income); and Model 3 further adjusted for health behaviors and conditions (smoking status, diabetes status, time since last dental visit, and depression). **Results:** In the unadjusted model (Model 1), reporting mouth pain "hardly ever" (OR: 0.60, 95% CI: 0.47-0.78) or "never" (OR: 0.64, 95% CI: 0.50-0.82) was associated with significantly lower odds of poorer health compared to "often." This association was attenuated but remained significant after adjusting for sociodemographic factors in Model 2. After full adjustment in Model 3, the relationship was no longer statistically significant for any frequency of mouth pain (e.g., "never" vs. "often": aOR: 0.91, 95% CI: 0.75-1.12). Other factors, including depression (aOR: 0.56, 95% CI: 0.48-0.67), diabetes, race/ethnicity, and income, were stronger independent predictors of poorer health status. **Conclusion:** The observed association between mouth pain and poorer general health status appears to be largely confounded by sociodemographic factors, comorbidities (particularly depression and diabetes), and health behaviors. These findings highlight the interplay between oral health and overall health and suggest that mouth pain may be a marker of broader health challenges rather than an independent driver of poor health status.

Keywords: Mouth Pain, Oral Health, General Health Status, NHANES, Health Disparities.

INTRODUCTION

The oral cavity and its surrounding structures play a vital role in human health, serving essential daily functions and contributing significantly to overall well-being [1]. Oral health can be defined as a multifaceted state that encompasses the ability to speak, smile, smell, taste, touch, chew, and swallow, as well as to express emotions confidently through facial expressions, all without pain, discomfort, or disease within the craniofacial complex. It represents a fundamental element of overall health and well-being, both physical and mental, existing along a continuum shaped by the values and attitudes of individuals and their communities [2]. This definition highlights the impact oral health has on quality of life, social functioning, and systemic health. Research highlights the critical role of the oral cavity in overall health, emphasizing the close association between oral diseases and a wide range of systemic conditions [3,4]. Poor oral health conditions, particularly periodontitis, have been linked to a heightened risk of various systemic diseases. These include cardiovascular disease, gastrointestinal and colorectal cancers, diabetes and insulin resistance, Alzheimer's disease, respiratory tract infections, and adverse pregnancy outcomes [5]. Periodontal pathogens and their metabolic by-products can influence immune responses beyond the oral cavity, thereby contributing to the onset and progression of systemic diseases [5].

As a result, oral manifestations may serve as early warning signs of underlying health conditions or as reflections of systemic inflammatory status. Among such manifestations, oral pain is one of the most common and debilitating experiences. Dental pain is a leading cause of impaired daily functioning, as it often interferes with essential activities such as chewing and sleeping [6,7].

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Consequently, it carries significant social and psychological burdens, ultimately diminishing health-related quality of life (HRQOL) [8,9]. Although the association between clinical oral diseases such as periodontitis and systemic health is well established, the connection between patient-reported symptoms, particularly the frequency of oral pain, and overall health status remains less thoroughly investigated in large population-based settings.

Self-rated health (SRH) is a widely recognized measure of overall health, and numerous studies have confirmed its predictive validity in older populations for outcomes such as future health status, functional decline, disability, and mortality [10]. Examining the impact of oral health problems, such as mouth pain, on self-rated general health offers valuable insight into the wider public health implications of oral diseases. This is particularly relevant in the context of health disparities, as access to dental care remains unequal, with socioeconomic factors and race/ethnicity contributing to unmet dental needs [11].

The aim of this study was to examine the association between the mouth pain and general health status in a nationally representative sample of U.S. adults using NHANES 2017–2018 data. We hypothesized that greater frequency of mouth pain would be independently linked to poorer general health status, even after controlling for key sociodemographic, behavioral, and clinical.

MATERIALS AND METHODS

Study Design

This study employed a cross-sectional design to investigate the association between the frequency of mouth pain and general health status among U.S. adults.

Data Source

Data were obtained from the National Health and Nutrition Examination Survey (NHANES) 2017–2020. NHANES is a nationally representative survey conducted by the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC) [11]. The survey collects comprehensive health data through interviews, physical examinations, and laboratory tests. NHANES uses a multistage, stratified probability sampling design, oversampling certain populations (e.g., older adults, racial/ethnic minorities) to ensure robust statistical estimates [12,13]. All participants provided written informed consent at the time of recruitment [14].

Study Population

The current analysis utilizes data from the 2017–2018 cycle. Participants were eligible for inclusion if they completed both the interview and examination. Participants under the age of 30 were excluded from this analysis (n=4,513). A total of 4,741 participants were eligible for the study (Figure 1).

The analytic sample was further limited to participants with complete information on the outcome (general health status), exposure (mouth pain frequency), and all covariates (age, gender, race/ethnicity, income, smoking status, diabetes status, time since last dental visit, and depression). Of the 4,741 participants who were eligible for the study, 631 were further excluded due to missingness. The final analytic sample included 4,110 participants ages 30+ who had complete data for all study variables.

VARIABLES

Outcome Variable

General Health Status was assessed during the interview with the question: “Would you say your health in general is excellent, very good,

good, fair, or poor?” Responses were categorized into five levels: Excellent, Very Good, Good, Fair, and Poor. For the cumulative logit model, the outcome was treated as an ordinal variable.

Exposure Variable

The exposure variable for this study was the self-reported frequency of mouth pain. The variable was derived from the question: “How often during the last year (have you/ has SP) had painful aching anywhere in (your/his/her) mouth?”

For this analysis, the original categories were consolidated into a four-level categorical variable as 'Often', 'Occasionally', 'Hardly ever', and 'Never'.

COVARIATES

The following covariates were selected for adjustment

Sociodemographic factors

Age group (30–49, 50–64, 65+), gender (Male, Female), race/ethnicity (Non-Hispanic White, Non-Hispanic Black, Hispanic, Other), and annual household income (Below poverty, At/above poverty).

Health behaviors and access

Smoking status (Never, Former, Current) and time since last dental visit (<1 year, 1–5 years, >5 years).

Health conditions

Diabetes status (Normal, Prediabetes, Diabetes) and depression (Depressed, Not Depressed), as defined by the Patient Health Questionnaire-9 (PHQ-9).

STATISTICAL ANALYSIS

Descriptive statistics were used to summarize the characteristics of the study population. Categorical variables were reported using unweighted counts and weighted percentages with their standard errors (SE). The distribution of all sociodemographic, behavioral, and health-related covariates for the total sample is presented in Table 1. Bivariate analyses were conducted to examine the distribution of covariates across categories of self-reported general health status. Survey-weighted Rao-Scott chi-square tests, which account for the complex survey design, were used for all categorical variables. The results of these analyses, including unweighted counts, weighted percentages, and p-values, are displayed in Table 2. To evaluate the association between the frequency of mouth pain and general health status, a series of multivariable cumulative logit regression models were fitted. These models estimate the cumulative odds of reporting a poorer health status category (e.g., Fair/Poor vs. Excellent/Very Good/Good). Three sequential models were constructed: Model 1: Unadjusted, including only the exposure variable (mouth pain frequency). Model 2: Adjusted for sociodemographic factors, including age category, gender, race/ethnicity, and income. Model 3: Fully adjusted for all covariates, including sociodemographic factors (from Model 2), smoking status, diabetes status, time since last dental visit, and depression. Results are presented as odds ratios (OR) and adjusted odds ratios (aOR) with their 95% confidence intervals (CI) in Table 3. All analyses accounted for the complex, multistage probability sampling design of NHANES in SAS version 9.4. This ensured that all estimates were nationally representative of the non-institutionalized U.S. adult population aged 30 years and older. Statistical tests were two-sided, and a p-value ≤ 0.05 was considered statistically significant.

RESULT

Among 4,110 adults aged ≥ 30 years, the weighted sample was 41.0% aged 30–49 years, 64.9% non-Hispanic White, and 20.1% living below the poverty line. Over one-third rated their health as fair/poor (19.8%), and 6.9% reported frequent mouth pain. More detailed information on the characteristics by general health status is presented in Table 1

General health status differed significantly by race/ethnicity, income, dental visits, smoking, diabetes, depression, and mouth pain (all $p < 0.001$). Participants reporting frequent mouth pain were more likely to

rate their health as fair or poor compared with those with no pain. Table 2

In unadjusted models, less frequent mouth pain was associated with lower odds of poorer health (OR = 0.60 for “hardly ever” vs. “often,” 95% CI: 0.47–0.78). These associations persisted after adjustment for sociodemographic factors but were attenuated and no longer significant after full adjustment. Depression, diabetes, and infrequent dental visits remained independently associated with poorer health. Table 3.

Table 1: Demographic and Health Characteristics of the Study Population

Characteristic	N (Unweighted %)	[Weighted % (SE)]
Age Groups		
30-49	1467 (35.7%)	[41.0% (1.4)]
50-64	1404 (34.2%)	[34.5% (1.4)]
65+	1239 (30.1%)	[24.6% (1.7)]
Race/Ethnicity		
Hispanic	895 (21.8%)	[14.3% (1.7)]
NH White	1490 (36.2%)	[64.9% (2.7)]
NH Black	969 (23.6%)	[10.7% (1.5)]
Other	756 (18.4%)	[10.1% (1.3)]
Annual Household Income		
Below poverty	1127 (27.4%)	[20.1% (1.7)]
At/above poverty	2983 (72.6%)	[79.9% (1.7)]
Gender		
Male	2008 (48.9%)	[48.2% (1.0)]
Female	2102 (51.1%)	[51.8% (1.0)]
Time Since Last Dental Visit		
<1 year	2197 (53.4%)	[61.0% (2.3)]
1-5 years	1196 (29.1%)	[25.9% (1.6)]
>5 years	717 (17.4%)	[13.1% (1.2)]
Smoking Status		
Never	2269 (55.2%)	[55.6% (1.7)]
Former	1077 (26.2%)	[27.4% (1.0)]
Current	764 (18.6%)	[17.0% (1.2)]
Diabetes Status		
Normal	2075 (50.5%)	[59.6% (1.3)]
Prediabetes	1369 (33.3%)	[28.8% (1.1)]
Diabetes	666 (16.2%)	[11.7% (0.6)]
Depression		
Not Depressed	3046 (74.1%)	[76.0% (0.9)]
Depressed	1064 (25.9%)	[24.0% (0.9)]
General Health Status		
Excellent	345 (8.4%)	[9.7% (0.7)]
Very good	963 (23.4%)	[30.5% (1.5)]
Good	1709 (41.6%)	[40.0% (1.1)]
Fair	946 (23.0%)	[17.4% (1.1)]
Poor	147 (3.6%)	[2.4% (0.3)]
Mouth Pain		
Often	350 (8.5%)	[6.9% (0.6)]

Occasionally	736 (17.9%)	[17.4% (1.0)]
Hardly ever	1248 (30.4%)	[31.0% (1.2)]
Never	1776 (43.2%)	[44.7% (1.5)]
Total sample: Unweighted N = 4,110		

1. Unweighted data shown as n (%) for categorical variables. 2. Weighted data shown as % (SE) for categorical variables. All percentages are column percentages. 3. Abbreviations: NH, Non-Hispanic; SE, Standard Error.

Table 2: Unweighted and Weighted Distribution of Select Covariates by General Health Status, NHANES (2017–2018) Total Sample: N = 4,110
Frequency (Unweighted %); Weighted % (Standard Error); p-value from Rao-Scott Chi-Square test.

Covariate	Excellent (Unweighted %, Weighted %)	Very Good (Unweighted %, Weighted %)	Good (Unweighted %, Weighted %)	Fair (Unweighted %, Weighted %)	Poor (Unweighted %, Weighted %)	Total (Unweighted %, Weighted %)	P-value
Age Group							0.6008
30–49	158 (10.8%, 11.6±1.4)	357 (24.3%, 29.1±2.1)	592 (40.4%, 38.8±1.8)	318 (21.7%, 18.4±1.4)	42 (2.9%, 2.1±0.4)	1467 (35.7%, 41.0±1.4)	
50–64	110 (7.8%, 8.4±1.2)	300 (21.4%, 30.3±3.0)	597 (42.5%, 42.2±2.7)	346 (24.6%, 16.4±1.4)	51 (3.6%, 2.7±0.7)	1404 (34.2%, 34.5±1.4)	
65+	77 (6.2%, 8.3±1.7)	306 (24.7%, 33.1±2.9)	520 (42.0%, 38.8±2.6)	282 (22.8%, 17.2±2.3)	54 (4.4%, 2.7±0.5)	1239 (30.1%, 24.6±1.7)	
Gender							0.5505
Male	197 (9.8%, 10.3±1.0)	474 (23.6%, 29.5±1.8)	831 (41.4%, 40.1±1.8)	442 (22.0%, 18.2±1.6)	64 (3.2%, 1.9±0.3)	2008 (48.9%, 48.2±1.0)	
Female	148 (7.0%, 9.2±1.2)	489 (23.3%, 31.4±2.1)	878 (41.8%, 39.9±2.1)	504 (24.0%, 16.6±1.0)	83 (3.9%, 2.9±0.4)	2102 (51.1%, 51.8±1.0)	
Race and Ethnicity							<.0001
Hispanic	67 (7.5%, 9.1±0.8)	124 (13.9%, 18.3±1.9)	364 (40.7%, 41.0±2.1)	300 (33.5%, 27.4±1.7)	40 (4.5%, 4.2±1.0)	895 (21.8%, 14.3±1.7)	
NH White	128 (8.6%, 10.3±1.0)	441 (29.6%, 34.8±1.8)	591 (39.7%, 38.8±1.3)	271 (18.2%, 14.1±1.3)	59 (4.0%, 2.0±0.3)	1490 (36.3%, 64.9±2.7)	
NH Black	63 (6.5%, 7.9±1.4)	206 (21.3%, 22.7±1.3)	415 (42.8%, 41.7±1.5)	256 (26.4%, 25.3±1.6)	29 (3.0%, 2.4±0.6)	969 (23.6%, 10.7±1.5)	
Other	87 (11.5%, 8.8±1.3)	192 (25.4%, 28.4±2.9)	339 (44.8%, 44.3±3.1)	119 (15.7%, 15.9±2.5)	19 (2.5%, 2.6±0.7)	756 (18.4%, 10.1±1.3)	
Income							<.0001
Below poverty	71 (6.3%, 6.7±0.8)	186 (16.5%, 21.2±2.3)	423 (37.5%, 39.2±2.0)	382 (33.9%, 27.7±2.3)	65 (5.8%, 5.2±1.0)	1127 (27.4%, 20.1±1.7)	
At/above poverty	274 (9.2%, 10.5±0.9)	777 (26.1%, 32.8±1.5)	1286 (43.1%, 40.2±1.4)	564 (18.9%, 14.8±1.3)	82 (2.7%, 1.7±0.3)	2983 (72.6%, 79.9±1.7)	
Last Dental Visit							<.0001
<1 year	212 (9.6%, 11.3±1.3)	635 (28.9%, 37.0±1.8)	890 (40.5%, 36.0±1.3)	408 (18.6%, 14.0±1.3)	52 (2.4%, 1.7±0.4)	2197 (53.4%, 61.0±2.3)	
1-5 years	98 (8.2%, 8.4±1.2)	228 (19.1%, 23.1±1.6)	502 (42.0%, 43.8±1.7)	323 (27.0%, 22.4±1.9)	45 (3.8%, 2.3±0.6)	1196 (29.1%, 25.9±1.6)	
>5 years	35 (4.9%, 4.6±0.9)	100 (13.9%, 14.7±2.1)	317 (44.2%, 51.2±2.2)	215 (30.0%, 23.2±2.1)	50 (7.0%, 6.3±1.2)	717 (17.4%, 13.1±1.2)	
Smoking Status							<.0001
Never	238 (10.5%, 12.5±1.1)	586 (25.8%, 33.1±1.7)	931 (41.0%, 38.6±1.6)	463 (20.4%, 14.7±1.0)	51 (2.2%, 1.1±0.2)	2269 (55.2%, 55.6±1.7)	
Former	66 (6.1%, 6.8±0.8)	247 (22.9%, 31.6±2.2)	462 (42.9%, 40.5±1.8)	244 (22.7%, 17.5±1.8)	58 (5.4%, 3.5±0.6)	1077 (26.2%, 27.4±1.0)	
Current	41 (5.4%, 5.2±1.0)	130 (17.0%, 20.0±2.1)	316 (41.4%, 43.7±1.9)	239 (31.3%, 26.2±1.9)	38 (5.0%, 4.9±1.3)	764 (18.6%, 17.0±1.2)	
Diabetes Status							<.0001
Normal	233 (11.2%, 12.4±1.1)	563 (27.1%, 34.5±1.8)	834 (40.2%, 37.2±1.4)	384 (18.5%, 13.9±1.4)	61 (2.9%, 2.0±0.3)	2075 (50.5%, 59.6±1.3)	
Prediabetes	96 (7.0%, 7.3±0.9)	307 (22.4%, 28.0±2.1)	587 (42.9%, 43.4±2.1)	331 (24.2%, 19.0±1.6)	48 (3.5%, 2.4±0.5)	1369 (33.3%, 28.8±1.1)	
Diabetes	16 (2.4%, 1.6±0.5)	93 (14.0%, 16.3±3.0)	288 (43.2%, 45.8±2.9)	231 (34.7%, 31.4±2.3)	38 (5.7%, 4.9±0.7)	666 (16.2%, 11.7±0.6)	
Depression							<.0001
Not Depressed	308 (10.1%, 11.6±0.9)	861 (28.3%, 35.7±1.4)	1335 (43.8%, 40.3±1.4)	512 (16.8%, 11.8±1.0)	30 (1.0%, 0.6±0.1)	3046 (74.1%, 76.0±0.9)	
Depressed	37 (3.5%, 3.5±0.8)	102 (9.6%, 14.0±2.8)	374 (35.2%, 38.9±2.0)	434 (40.8%, 35.2±2.1)	117 (11.0%, 8.4±0.9)	1064 (25.9%, 24.0±0.9)	
Mouth Pain							<.0001

Often	13 (3.7%, 3.9±1.4)	42 (12.0%, 13.8±2.5)	112 (32.0%, 41.2±4.3)	145 (41.4%, 32.4±2.7)	38 (10.9%, 8.7±1.4)	350 (8.5%, 6.9±0.6)
Occasionally	37 (5.0%, 5.7±1.6)	137 (18.6%, 25.9±2.8)	309 (42.0%, 40.7±2.7)	220 (29.9%, 24.5±3.0)	33 (4.5%, 3.1±0.5)	736 (17.9%, 17.4±1.0)
Hardly ever	93 (7.5%, 7.5±0.7)	296 (23.7%, 31.3±2.7)	560 (44.9%, 43.4±2.0)	259 (20.8%, 15.7±1.4)	40 (3.2%, 2.1±0.5)	1248 (30.4%, 31.0±1.2)
Never	202 (11.4%, 13.7±1.5)	488 (27.5%, 34.3±1.7)	728 (41.0%, 37.1±1.5)	322 (18.1%, 13.5±1.1)	36 (2.0%, 1.4±0.4)	1776 (43.2%, 44.7±1.5)

Note: NH = Non-Hispanic; HS = High School; P-values are from the Rao-Scott Chi-Square test, which accounts for the complex survey design

Table 3: Multivariable cumulative logit models describing the relationship between frequency of mouth pain and general health status, NHANES 2017–2018 (n = 4,110) (Outcome: Cumulative odds of poorer health status; Reference for mouth pain: 'Often')

Variable	Model 1 OR [95% CI]	Model 2 aOR [95% CI]	Model 3 aOR [95% CI]
Mouth/Oral/Dental Pain			
Hardly ever vs Often	0.60 [0.47, 0.78]**	0.64 [0.49, 0.85]**	0.82 [0.65, 1.04]
Never vs Often	0.64 [0.50, 0.82]**	0.70 [0.56, 0.89]**	0.91 [0.75, 1.12]
Occasionally vs Often	0.76 [0.58, 0.99]*	0.80 [0.62, 1.03]	0.94 [0.77, 1.15]
Often (ref)	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Age Category			
30–49 vs 65+	–	1.12 [0.86, 1.47]	1.17 [0.92, 1.50]
50–64 vs 65+	–	0.98 [0.72, 1.34]	0.99 [0.74, 1.32]
65+ (ref)	–	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Gender			
Female vs Male	–	0.87 [0.71, 1.06]	0.86 [0.72, 1.01]
Male (ref)	–	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Race/Ethnicity			
Hispanic vs NH White	–	1.65 [1.40, 1.93]***	1.61 [1.41, 1.85]***
NH Black vs NH White	–	1.46 [1.23, 1.73]***	1.38 [1.19, 1.60]***
Other vs NH White	–	1.10 [0.83, 1.45]	1.08 [0.85, 1.37]
NH White (ref)	–	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Income			
Below poverty vs At/above poverty	–	1.29 [1.04, 1.60]*	1.17 [0.99, 1.39]
At/above poverty (ref)	–	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Smoking Status			
Current vs Never	–	–	1.02 [0.86, 1.21]
Former vs Never	–	–	0.84 [0.72, 0.98]*
Never (ref)	–	–	1.00 [1.00, 1.00]
Diabetes Status			
Normal vs Diabetes	–	–	0.66 [0.54, 0.82]***
Prediabetes vs Diabetes	–	–	0.76 [0.62, 0.93]**
Diabetes (ref)	–	–	1.00 [1.00, 1.00]
Last Dental Visit			
1-5 years vs <1 year	–	–	1.37 [1.08, 1.72]**
>5 years vs <1 year	–	–	1.36 [1.11, 1.67]**
<1 year (ref)	–	–	1.00 [1.00, 1.00]
Depression			
Not Depressed vs Depressed	–	–	0.56 [0.48, 0.67]***
Depressed (ref)	–	–	1.00 [1.00, 1.00]

Model 1: Unadjusted model for mouth pain. **Model 2:** Adjusted for age category, gender, race/ethnicity, and income. **Model 3:** Additionally adjusted for smoking status, diabetes status, time since last dental visit, and depression.***p < 0.001; **p < 0.01; *p < 0.05. Note: OR = Odds Ratio; aOR = Adjusted Odds Ratio; CI = Confidence Interval; ref = reference group. The outcome is the cumulative odds of being in a poorer health status category (e.g., Fair/Poor vs. Excellent/Very Good/Good).

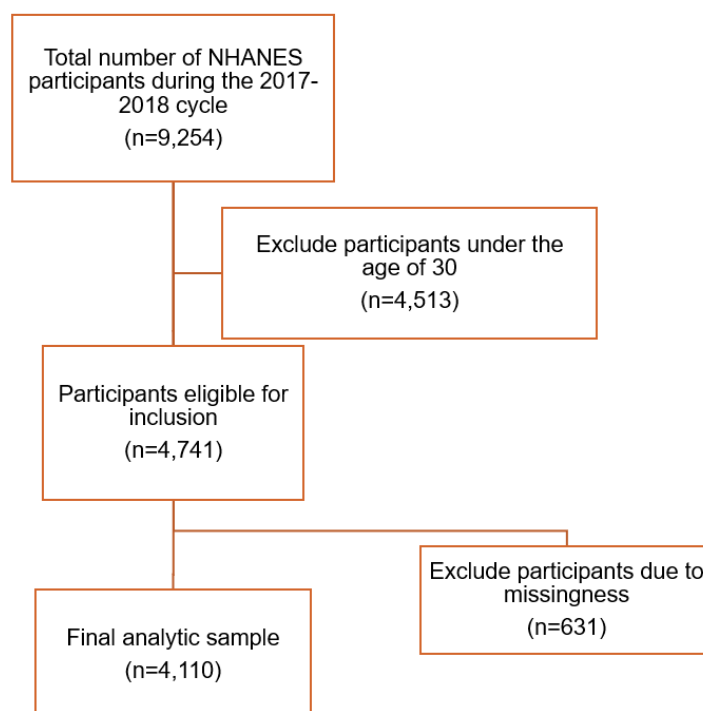


Figure 1: CONSORT diagram of the study

DISCUSSION

This study examined the relationship between the frequency of self-reported mouth pain and general health status in a nationally representative sample of U.S. adults. The findings indicate that although more frequent mouth pain was significantly associated with poorer self-rated health in unadjusted analyses, this association was fully attenuated and no longer statistically significant after controlling for sociodemographic characteristics, health behaviors, and comorbidities. Notably, depression, diabetes, race/ethnicity, and infrequent dental care utilization emerged as stronger independent predictors of poorer health status. Our preliminary results were consistent with prior studies, indicating that oral health problems are associated with worse perceptions of overall health [15,16].

The unadjusted analyses showed that individuals reporting mouth pain “often” had markedly greater odds of fair or poor self-rated health compared with those experiencing pain less frequently or not at all. This association is biologically plausible, as persistent oral pain may interfere with nutrition, disrupt sleep, and hinder social functioning, ultimately reducing overall quality of life and perceived general health [17].

However, the attenuation of the association after sequential adjustment points to a more nuanced relationship. The loss of significance in the fully adjusted model (Model 3) suggests that the bivariate association is not independent but largely explained by confounding factors. This implies that mouth pain frequently co-occurs with socioeconomic disadvantage and comorbid health conditions, which themselves strongly influence poor self-rated health.

In the fully adjusted model, depression emerged as the strongest predictor. Participants without depression had 44% lower odds of reporting poor health (aOR = 0.56) compared with those experiencing depression. This finding is consistent with other research confirming that mental health served as a mediator in the association between physical health and self-rated general health [18,19]. Similarly, diabetes status was a strong correlate of poorer health. Individuals with normal glycemic status had significantly lower odds of poor health compared to those with diabetes. This aligns with known literature where the burden

of diabetes, such as diabetic distress [20] impacts an individual's perception of their health.

Socioeconomic factors, such as income and race/ethnicity, also played a critical role in the observed associations. Throughout the life course, individuals living in disadvantaged communities face greater risks of chronic diseases, mortality, and reduced life expectancy [21,22,23]. These groups often face barriers to dental care access, which may result in untreated oral conditions and persistent mouth pain, further compounding their health challenges.

The subjective nature of self-rated general health may introduce variability influenced by psychological or cultural factors. Additionally, the self-reported nature of mouth pain may be subject to recall bias or differing pain thresholds among participants. The cross-sectional design of this study limits causal inference, as it cannot determine whether mouth pain precedes or results from poorer general health. Future longitudinal studies are needed to elucidate the temporal relationship between oral pain and overall health status. Finally, while we adjusted for several confounders, residual confounding from unmeasured variables (e.g., stress, access to medical care, nutritional status) is possible.

Despite these limitations, the study has strengths, including the use of a large, nationally representative sample, the use of survey weights to ensure generalizability, and the examination of a of potential confounding variables through sequential modeling.

In conclusion, while mouth pain is associated with poorer self-rated general health in unadjusted analyses, this relationship is largely explained by sociodemographic factors, health behaviors, and comorbidities. Mouth pain may serve as an indicator of broader health challenges rather than a direct cause of poor health status.

Conflicts of Interest

The author reports no conflicts of interest.

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