

# Tooth pain, social vulnerability, and health inequities among homeless individuals: census-based study

*Dor de dente e desigualdades em saúde entre pessoas em situação de rua: um estudo censitário*

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## ABSTRACT

This study aimed to assess the prevalence of tooth pain and its correlated factors among a large homeless population in Belo Horizonte, Brazil, using data from the IV Census of the Homeless Population (2022). A cross-sectional, census-based study was conducted, incorporating data from a structured questionnaire covering sociodemographic factors, health conditions, and access to public healthcare services. The presence of self-reported tooth pain was analysed using descriptive statistics and logistic regression models to estimate adjusted odds ratios (ORs). Among 2,461 homeless individuals surveyed, 33.3% reported experiencing tooth pain. Prevalence was higher among women, individuals with children, and those with specific health conditions such as sexually transmitted infections (STIs) and HIV/AIDS. Logistic regression analysis revealed that a antecedent of domestic violence (OR = 2.57; 95% CI = 1.12–5.92), psychiatric hospitalization (OR = 1.74; 95% CI = 1.03–2.95), and depressive disorder (OR = 2.06; 95% CI = 1.42–3.00) significantly increased the likelihood of reporting tooth pain. Conversely, good overall health status was a protective factor, reducing the probability of tooth pain by 48.8% (OR = 0.51; 95% CI = 0.30–0.88). The high prevalence of tooth pain among homeless individuals underscores the need for integrated dental and mental health services. Strengthening public health policies and intersectoral collaboration is critical to addressing oral health disparities in vulnerable populations.

**Keywords:** Social vulnerability; Homeless individuals; Oral health; Dental pain; Mental health; Census research.

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## RESUMO

Este estudo investigou a prevalência de dor de dente e seus fatores associados em uma ampla população em situação de rua em Belo Horizonte, Brasil, com base nos dados do IV Censo da População em Situação de Rua (2022). Trata-se de uma análise *ad hoc* de um estudo transversal de base censitária, que analisou informações de um questionário estruturado sobre fatores sociodemográficos, condições de saúde e acesso a serviços públicos. A dor de dente autorreferida foi avaliada por estatísticas descritivas e modelos de regressão logística, estimando razões de chances ajustadas (ORs). Entre os 2.461 indivíduos em situação de rua entrevistados, 33,3% relataram dor de dente. A prevalência de dor de dente foi maior entre mulheres, indivíduos com filhos e aqueles com determinadas condições de saúde, como infecções sexualmente transmissíveis (ISTs) e HIV/AIDS e transtornos mentais. A análise de regressão logística revelou que antecedentes de violência doméstica (OR = 2,57; IC 95% = 1,12–5,92), internação psiquiátrica (OR = 1,74; IC 95% = 1,03–2,95) e transtorno depressivo (OR = 2,06; IC 95% = 1,42–3,00) aumentaram significativamente a probabilidade de relato de dor de dente. Por outro lado, um bom estado geral de saúde foi um fator protetor, reduzindo a probabilidade de dor de dente em 48,8% (OR = 0,51; IC 95% = 0,30–0,88). A alta prevalência de dor de dente entre pessoas em situação de rua evidencia a necessidade de estratégias integradas de saúde bucal e saúde mental. O fortalecimento de políticas públicas e da colaboração intersetorial é essencial para reduzir desigualdades e ampliar o acesso à saúde bucal em populações vulneráveis.

**Palavras-chave:** Vulnerabilidade social; População em situação de rua; Saúde bucal; Dor de dente; Saúde mental; Pesquisa censitária.

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## Introduction

The homeless population experiences multidimensional vulnerability, including socioeconomic exclusion, limited access to healthcare, and poor oral health outcomes<sup>1</sup>. Oral health is particularly affected by inadequate hygiene practices, lack of clean water, and restricted access to dental services<sup>2-3</sup>. These barriers contribute to a cycle of marginalization, where untreated dental conditions lead to chronic pain, impair self-esteem, and hinder social reintegration<sup>4</sup>.

Studies suggest that homelessness is associated with a higher prevalence of dental caries, periodontal disease, and tooth loss compared to the general population<sup>5-6</sup>. In Brazil, approximately 81.9% of homeless individuals report negative impacts on oral health, compared to 51.3% of adults and 55.3% of elderly individuals in the general population<sup>7-8</sup>. Given the importance of oral health in overall well-being, understanding the factors associated with tooth pain in this population is essential for developing targeted public health interventions.

Ayres' expanded approach allows a more in-depth assessment of the three interrelated dimensions of the homelessness and oral health issues<sup>9-10</sup>. First, the individual dimension comprises biological and behavioural factors, such as poor oral hygiene, malnutrition, and the prevalence of mental disorders, which may impair self-care<sup>10</sup>. Second, the social dimension includes determinants such as economic exclusion, broken family ties, and discrimination, all of which further decrease social resilience and restrict access to healthcare services<sup>1</sup>. Finally the programmatic dimension refers to shortcomings in public policies and health services, which often fail to adequately meet the needs of the homeless population, perpetuating the cycle of vulnerability and deprivation<sup>9</sup>.

Moreover, as highlighted by the World Health Organization<sup>11</sup>, social determinants of health (SDH), are determined by economic, social, and environmental factors. Extreme poverty increases exposure to oral diseases and limit or hinder access to preventive and curative care<sup>12</sup>. Furthermore,

the coexistence of malnutrition, smoking, violence, and mental disorders further exacerbates the deterioration of oral health<sup>13-15</sup>.

Tooth pain, frequently reported in this population, constitutes a dental emergency with the potential to become chronic, impacting individuals' physical and emotional well-being<sup>16-19</sup>. Untreated dental caries and periodontal disease result in persistent pain, compromising quality of life and social functioning<sup>17-19</sup>. Additionally, chronic pain can worsen mental disorders, such as depression, anxiety and dementia, increasing healthcare costs and demand<sup>20-21</sup>. Tooth pain, as a significant oral health indicator<sup>22</sup>. It reflects major oral issues such as carious lesions and periodontal disease, serving as an efficient and comprehensive measure for assessing oral health conditions in vulnerable populations, including the homeless<sup>22-23</sup>.

From a public health perspective, the relationship between oral health and overall health must be recognized, as dental problems compromise essential functions such as eating and sleeping and deepen health inequalities<sup>4,16-17,19-20</sup>. The appropriate management of tooth pain and related conditions should be a priority in public policies aimed at vulnerable populations, integrating dental care with social support.

This study hypothesis is that the prevalence of tooth pain among the homeless population of Belo Horizonte is associated with sociodemographic factors, mental health conditions, and systemic diseases.

## Methods

### Study Design

The present study performed an *ad hoc* analysis of the census-based cross-sectional conducted to assess the size and the characteristics of the homeless population of Belo Horizonte, state of Minas Gerais Brasil, the Fourth Belo Horizonte Homeless Population Census (4PEHC).

Belo Horizonte, the capital of the state of Minas Gerais, has a population of 2.35 million within the city and 5 million in its greater metropolitan area, according to the 2022 National Census<sup>24</sup>. The city is the sixth largest Brazilian capital. It has been a pioneer in implementing public policies to address homelessness and three previous censuses were conducted by the local public administration, in 1998, 2005 and 2013<sup>25-27</sup>.

The study was approved by the UFMG Ethics Committee (CAAE 59335022.7.0000.5149). All participants signed the Free and Informed Consent Form (TCLE), ensuring confidentiality and the freedom to withdraw from participation at any time.

Data collection took place from October 19 to 21, 2022, between 7:00 a.m. and midnight, to maximize the opportunity for interviews outside of shelters. A participatory methodology was employed, incorporating the knowledge and mediation of individuals with past experiences of homelessness. These individuals assisted in shaping the data collection strategy and worked alongside researchers to facilitate initial contact with potential participants.

Data collection sites were selected based on geographical information provided by the Municipal Office of Social Assistance, Food Security, and Citizenship (SMASAC).

Locations were identified based on social interventions involving PEH over the preceding year and validated by municipal social workers, non-governmental organizations (NGOs), and PEH community leaders. The census encompassed shelters, hospitals, social assistance institutions, community restaurants, streets, slums, temporary housing, and degraded areas classified by the Brazilian Census Bureau, including abandoned buildings, stores, and factories used as provisional residences. A total of 1.344 collection sites were mapped, with each location visited at least twice during the moments when PEH were most likely to be present.

During data collection, pairs of researchers presented the study objectives and potential benefits to people experiencing homelessness (PEH). Trained interviewers then conducted face-to-face interviews with participants who provided informed consent. All data were collected digitally using tablets and stored in a secure database hosted by the Federal University of Minas Gerais (UFMG). Access to the dataset was restricted to the NAVES-UFMG research team and protected by individual login credentials, ensuring both confidentiality and data integrity. The final management and consolidation of the dataset were under the responsibility of the study coordinators affiliated with NAVES-UFMG.

### Participants

The study included all subjects aged 18 years or older who met the definition of PEH as "a heterogeneous population group with the common characteristics of extreme poverty, broken or weak family ties, lack of regular conventional housing, and that uses public byways and degraded areas as spaces for temporary or permanent housing and subsistence, as well as overnight or temporary shelters as provisional housing".

The study excluded subjects who were unable to provide informed consent, who presented in an inebriated state or who had observable psychiatric symptoms. The collection teams counted all the subjects in the sites where PEH were found.

### Assessed parameters

The study's dependent variable 'tooth pain was assessed by self-reported question: "Do you have a toothache?", accordingly to the strategy used in the 2010's National Oral Health Survey<sup>8</sup>. This approach was used to decrease data collection time and provide a significant oral health indicator, considering the impossibility to perform a comprehensive oral health assessment of each participant.

**Sociodemographic characteristics:** Age, sex, sexual orientation, skin color, marital status, educational attainment, employment status, and average monthly income.

**Homelessness trajectory:** Place of origin, duration of homelessness, primary reasons for becoming homeless, history of incarceration or long-term hospitalization, and family network.

**Health and well-being:** Food security, self-perceived health status, medical history, medication use, and substance use.

**Community engagement:** Participation in cultural and associative activities.

Access to support services: Utilization of public services dedicated to assisting PEH.

### Data Analysis

Descriptive statistics were performed for all variables. The sample was stratified accordingly to the presence or absence of tooth pain. The association between the presence of tooth pain and explanatory variables was evaluated using the chi-square test with Bonferroni post-hoc analysis. All variables with a p-value below 0.2 were selected for logistic regression modelling, given the binary nature of the outcome. The statistical model was refined until only variables with a p-value below 0.05 remained.

### Results

A total of 5,344 homeless individuals were identified, with 2,403 completed the study questionnaire (Figure 1). Only 1.5% did not respond the tooth pain question; thus, the final analysis included 2,365 individuals.

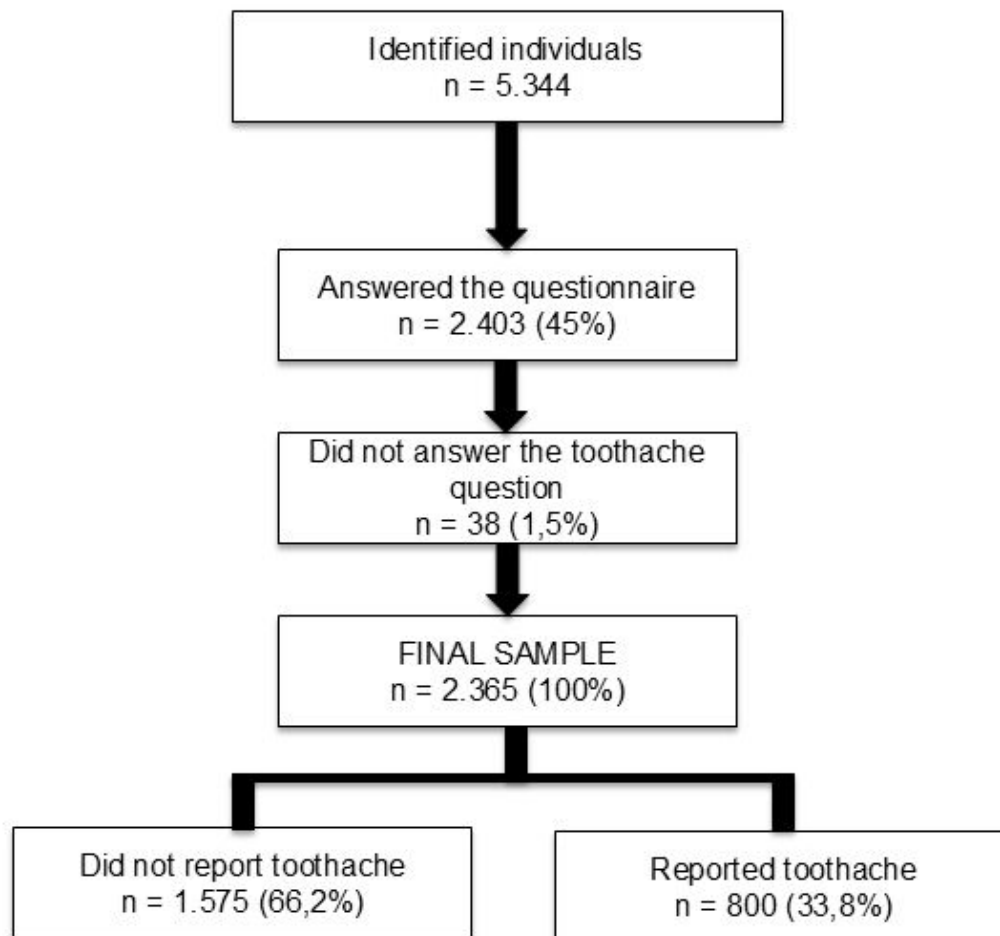
Among the respondents, 800 (33.8%) reported experiencing tooth pain. Table 1 presents the univariate

analysis comparing those who reported tooth pain with those who did not.

Tooth pain was statistically more prevalent in women than men, subjects aged less than 49 years old, and those with the lower levels of education. Furthermore, individuals living with a partner or children were more likely to report tooth pain. Statistically significant associations were observed between tooth pain and a history of domestic violence, psychiatric hospitalization, and incarceration (Table 1).

General and mental health conditions, except tuberculosis and hepatitis, and drug abuse were more likely to report tooth pain than individuals without these conditions (Table 2).

All variables with a p-value < 0.2 were included in the logistic regression model (Table 1 and 2). In the final model, individuals who migrated from other cities were 1.45 times more likely to report tooth pain compared to those residing in Belo Horizonte. Those living with children had 1.90 times higher odds of reporting tooth pain, while individuals who had experienced domestic violence were 2.57 times more likely to report this condition (Table 3).



**Figure 1.** Flow of participants in the Fourth Belo Horizonte Homeless Population Census (4PEHC).

**Legend:** Elaborated by authors.

**Table 1.** Sociodemographic, economic, and previous history issues prevalence between homeless subjects reporting and not reporting tooth pain.

Variable	Reported Tooth Pain			p-value
	No (%)	Yes (%)	Total(%)	
<b>Entire sample</b>	1.565 (66.2)	800 (33.8)	2.365 (100)	<b>0.000</b>
<b>Sex</b>				
Male	1.354 (86.5)	636 (79.5)	1.990 (84.1)	<b>0.000</b>
Female	211(13.5)	<b>164 (20.5)</b>	375 (15.9)	
<b>Age Group (years)</b>				
18-19	24 (1.6)	13 (1.6)	37 (2)	<b>0.000</b>
20-29	235 (15.2)	140 (17.7)	375 (16)	
30-39	387 (25)	226 (28.6)	613 (26)	
40-49	421 (27.2)	245 (31)	666 (28)	
50-59	<b>316 (20.4)</b>	121 (15.3)	437 (18)	
60-69	<b>139 (9)</b>	40 (5.1)	179 (8)	
≥ 70	<b>26 (1.7)</b>	5 (0.6)	31 (1)	
<b>Education Level</b>				
Never attended school	58 (7.9)	<b>40 (10.9)</b>	98 (4)	<b>0.015</b>
Completed primary education	168 (23)	<b>97 (26.5)</b>	265 (11)	
Incomplete secondary/technical education	181 (24.8)	91 (24.9)	272 (12)	
Completed secondary/technical education	234 (32)	105 (28.7)	339 (14)	
Incomplete higher education	56 (7.7)	11 (3)	67 (3)	
Completed higher education	34 (4.7)	22 (6)	56 (2)	
<b>Income</b>				
Less than ½ MW (< R\$ 750.00)	431 (69.7)	242 (74.5)	673 (28)	0.126
Between ½ and 1 MW (up to R\$ 1400.00)	139 (22.5)	53 (16.3)	192 (8)	
Between 1 and 2 MW (up to R\$ 2800.00)	37 (6)	21 (6.5)	58 (2)	
More than 2 MW (> R\$ 2800.00)	11 (1.8)	9 (2.8)	20 (1)	
<b>Place of Origin</b>				
Belo Horizonte	64.7 (41.1)	350 (44)	997 (42)	0.176
Other cities	918 (58.9)	445 (56)	1.363 (58)	
<b>Living in couple</b>				
Yes	322 (20.6)	<b>197 (24.6)</b>	519 (22)	<b>0.025</b>
No	1241 (79.4)	603 (75.4)	1.844 (78)	
<b>Has children</b>	1.004 (64.6)	535 (67)	1.539 (65)	0.248
<b>Lives with children</b>	59 (5.9)	<b>48 (9)</b>	107 (5)	<b>0.024</b>
<b>Motivation for Homelessness</b>				
Domestic Violence	50 (3.2)	<b>43 (5.4)</b>	93 (4)	<b>0.010</b>
Unemployment	<b>318 (20.3)</b>	133 (16.6)	451 (19)	<b>0.030</b>
<b>Previous history of institutionalization</b>				
Shelters	<b>1.063 (67.9)</b>	496 (52)	1559 (66)	<b>0.004</b>
Nursing homes	60 (3.8)	24 (3)	84 (4)	0.300
Juvenile detention system	175 (11.2)	<b>118 (14.8)</b>	293 (12)	<b>0.013</b>
Prison system	647 (41.3)	<b>393 (49.1)</b>	1.040 (44)	<b>0.000</b>

CERSAM/CAPS	281 (18)	<b>187 (23.4)</b>	468 (20)	<b>0.002</b>
Psychiatric hospital	144 (9.2)	<b>115 (14.4)</b>	259 (11)	<b>0.000</b>
Therapeutic community	416 (26.6)	<b>252 (31.5)</b>	668 (28)	<b>0.012</b>

**Caption:** \* Chi-square test. \*Bold values indicate statistically significant associations ( $p < 0.05$ ) between the analyzed variables and the occurrence of tooth pain in the homeless population. CERSAM/CAPS = Mental Health Centres;

**Table 2.** Comparison of health issues between homeless subjects presenting and not presenting tooth pain.

Health Variables	Reported Tooth Pain			p-value
	No (%)	Yes (%)	Total(%)	
Has any health condition	567 (36.4)	<b>402 (50.4)</b>	969 (42)	<b>0.000</b>
Tuberculosis	36 (2.3)	26 (3.3)	62 (3)	0.171
Hepatitis	39 (2.5)	31 (3.9)	70 (4)	0.060
Sexual Transmitted Infections	57 (3.7)	<b>72 (9)</b>	129 (5)	<b>0.000</b>
HIV/AIDS	31 (2)	<b>44 (5.5)</b>	75 (4)	<b>0.000</b>
<i>Diabetes mellitus</i>	83 (5.3)	<b>56 (7)</b>	139 (6)	0.097
Hypertension	203 (13)	<b>137 (17.1)</b>	340 (14)	<b>0.006</b>
Skin diseases	97 (6.2)	<b>76 (9.5)</b>	173 (7)	<b>0.004</b>
Depression	354 (22.6)	<b>270 (33.8)</b>	624 (26)	<b>0.000</b>
Schizophrenia	72 (4.6)	<b>62 (7.8)</b>	134 (6)	<b>0.002</b>
Anxiety/ Nervousness	355 (22.7)	<b>259 (32.4)</b>	614 (26)	<b>0.000</b>
Alcoholism	620 (39.6)	<b>379 (47.4)</b>	999 (42)	<b>0.000</b>
Smoking	803 (51.3)	<b>483 (60.4)</b>	1.286 (54)	<b>0.000</b>
Drug use	675 (43.1)	<b>401 (50.1)</b>	1076 (45)	<b>0.001</b>
Regular medication use	439 (28.1)	<b>287 (36)</b>	726 (31)	<b>0.001</b>

**Caption:** \* Chi-square test. \*Bold values indicate statistically significant associations ( $p < 0.05$ ) between the analyzed variables and the occurrence of tooth pain in the homeless population. HIV = *Human Immunodeficiency Virus*; AIDS = *Acquired Immunodeficiency Syndrome*.

**Table 3.** Multiple Logistic Regression Model for Tooth Pain Odds.

Constant	0.503	0.018	-
Lives with children	1.904	0.003	1.035 - 3.501
Domestic violence	2.573	0.026	1.119 - 5.918
History of psychiatric hospitalization	1.742	0.038	1.028 - 2.954
Health	0.512	0.015	0.298 - 0.879
STD/STI	2.729	0.004	1.375 - 5.425
AIDS/HIV	4.791	0.023	1.242 - 18.484
Depression	2.060	0.008	1.417 - 2.996

**Caption:** \*Multiple logistic regression model for toothache odds. The analysis was performed using the Wald test, with a correct classification rate of 70.3%. OR: Odds Ratio; C.I.: Confidence Interval. STD = *Sexually Transmitted Disease*; STI = *Sexually Transmitted Infection*; HIV = *Human Immunodeficiency Virus*; AIDS = *Acquired Immunodeficiency Syndrome*.

Additionally, individuals with a history of psychiatric hospitalization had 1.74 times higher odds of reporting tooth pain. The presence of STIs and HIV/AIDS increased the likelihood by 2.73 and 4.79 times, respectively. Individuals with depression were twice as likely to report tooth pain.

Conversely, good overall health was associated with a 48.8% reduction in the likelihood of reporting tooth pain (OR

= 0.512,  $p = 0.015$ ), indicating its protective effect against this condition.

## Discussion

This study highlights the significant burden of tooth pain among the homeless population of Belo Horizonte. The

33.8% prevalence found in this study is markedly higher than that observed in the Brazilian general population, which is of 11% to 23%<sup>8</sup>, reinforcing the need for targeted oral health interventions.

Tooth pain prevalence in the current study was 1.59 times higher than that observed among adolescents (20.9%), 1.44 times higher than among adults (23.2%), and three times higher than that recorded among the elderly (11.1%) in the general Brazilian population<sup>8</sup>. Compared to another highly vulnerable population — survivors of the Fundão Dam collapse, who presented a tooth pain prevalence of 16.9% the participants of the current study presented nearly twice the risk of reporting tooth pain<sup>16</sup>.

The prevalence of tooth pain found in this study is lower than those reported in previous studies assessing this condition in homeless populations. Freire<sup>17</sup> (2022) found a 50% prevalence of tooth pain in a cross-sectional study conducted in Goiânia, Brazil, with a convenience sample of 342 homeless individuals recruited from the only municipal public shelter<sup>17</sup>. The study used a structured questionnaire to assess self-reported tooth pain over the previous six months, along with its intensity and impact on daily activities. The hypothesis was that limited access to dental care, combined with poor oral hygiene and substance use, would result in a high prevalence of tooth pain and significant impacts on quality of life. The higher prevalence found in Freire's study can likely be explained by the retrospective six-month recall period used, which tends to capture both acute and chronic episodes of pain, and by the sample setting, which included individuals residing in shelters with limited access to care and potentially more severe oral health issues.

Similarly, Comassetto (2021)<sup>28</sup> found a 48.9% prevalence of tooth pain in a cross-sectional study with 214 homeless individuals in Porto Alegre, southern Brazil. The participants were recruited from shelters, homeless hostels, and day centres, and data were collected through structured interviews and clinical oral examinations. The hypothesis of Comassetto's study was that longer periods of homelessness and socioeconomic vulnerability would be associated with worse oral health and higher prevalence of tooth pain. The higher prevalence reported may be due to the retrospective questioning about lifetime and six-month tooth pain episodes, combined with self-performed pain management strategies, suggesting a chronic pattern of untreated oral conditions in this population<sup>28</sup>.

Differently from these studies, the present research was the first to assess tooth pain at the exact time of data collection, providing a real-time, more accurate snapshot of acute tooth pain in this population. The use of a retrospective six-month criterion in previous studies tends to inflate prevalence rates, as it captures cumulative and chronic episodes of tooth pain, whereas real-time assessment reduces recall bias and focuses on current pain, which explains the lower prevalence found in our study.

Our findings align with previous research indicating a strong association between mental health conditions and oral health deterioration. Depression, psychiatric hospitalization, and substance use disorders significantly increased the risk

of experiencing tooth pain. The correlation between mental disorders and tooth pain has been widely documented in the literature. According to the meta-analysis by Kisely (2016)<sup>15</sup>, individuals with depression and anxiety are 1.94 times more likely to present extensive caries and tooth loss compared to the general population<sup>25</sup>. These findings reinforce the intersection between mental health and oral health, indicating that psychiatric disorders directly contribute to worsening dental conditions among homeless individuals<sup>15,29-32</sup>.

The use of psychoactive substances also correlated with the likelihood of tooth pain in individuals. These findings align with literature indicating that drug users are more prone to develop periodontal disease and chronic dental pain<sup>33-35</sup>. Xerostomia, a common side effect of psychotropic medications and illicit substances, such as crack or methamphetamine, exacerbates this condition by increasing susceptibility to caries and periodontal infections<sup>32,34</sup>. The prevalence of anxiety disorders in the homeless population and their impact on tooth pain reinforce the findings of Santos<sup>16</sup> (2022), which also demonstrated a strong relationship between mental disorders and oral pain in vulnerable populations<sup>16</sup>.

The link between HIV/AIDS and higher prevalence of tooth pain underscores the importance of integrating dental care into broader healthcare services for immunocompromised individuals. Infectious diseases were also significantly associated with tooth pain. Individuals with STDs/STIs had 2.73 times higher odds of reporting tooth pain, while those living with HIV/AIDS had a 4.79 times higher risk. The immunosuppression characteristic of these conditions increases susceptibility to oral infections, extensive caries, and advanced periodontal disease<sup>36-38</sup>. These findings emphasize the need for specialized dental care for people living with HIV/AIDS, ensuring preventive treatment and appropriate management of oral complications, thus reducing the impact of these infections on their quality of life<sup>36</sup>.

Racial inequality also emerged as a significant factor. Black and mixed-race individuals represented 81.5% of the sample, reflecting structural barriers to dental healthcare access. Structural racism influences treatment recommendations, with Black patients being 2.3 times more likely to be referred for dental extractions rather than conservative treatments when compared to white individuals<sup>39-40</sup>. Gender analysis revealed that women had a tooth pain prevalence 1.65 times higher (77.7%) than men (47%), a statistically significant difference ( $p < 0.001$ ).

The study also confirms that social determinants, such as exposure to violence and economic hardship, contribute to oral health disparities. Women, who reported higher levels of both violence and tooth pain, represent a particularly vulnerable subgroup. Public health policies must incorporate trauma-informed care and prioritize access to preventive and curative dental services.

Additionally, the relationship between violence and tooth pain emerged as a concerning factor, especially among individuals who had experienced domestic violence, who had a 2.57 times higher risk of reporting dental pain. Continuous exposure to violence impacts oral health directly through

dental trauma and indirectly through neglect of self-care and psychological consequences<sup>40-41</sup>. These data corroborate studies indicating violence as a determinant in the deterioration of oral health, exacerbating vulnerabilities and underscoring the need for interventions that integrate dental care and psychosocial support<sup>41,43</sup>.

Despite its strengths, this study has limitations. The reliance on self-reported data introduces the potential for recall bias and may not reflect of completely edentulous individuals. Additionally, the lack of clinical examinations limits the ability to objectively assess the severity of oral health conditions.

These findings highlight the urgent need for more inclusive and integrated public policies that promote equitable access to dental care for vulnerable populations.

## Conclusion

This study provides valuable insights into the oral health challenges faced by homeless individuals. The high prevalence of tooth pain underscores the intersection between social determinants, mental health conditions, and access to healthcare services. Addressing these disparities requires coordinated efforts across public health, social services, and mental health sectors. Future research should explore longitudinal data to better understand causality and the long-term impact of interventions on oral health outcomes in this population.

## Authors' Declaration of Potential Conflicts of Interest

The authors declare no conflicts of interest.

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## Role of sponsor

The funding organizations played no role in the study's design, review, interpretation of data, or preparation or approval of the manuscript.

## Data availability

The datasets that were generated and analysed in this study are available from the corresponding author upon request.

## Author Contributions:

We describe contributions to the papers using the taxonomy (CRediT) provide above:

NM Teixeira, SM Caligiorne, F Garcia were responsible for the conception and planning of the study. NM Teixeira, N

Font, AI Xavier, SK Coutinho, JG Malheiros participated in data collection. NM Teixeira, SM Caligiorne, JG Malheiros, F Garcia conducted the data analysis. NM Teixeira drafted the final manuscript. *All authors reviewed and approved the final submitted.*

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