Original Article

ORAL HYGIENE PRACTICES AMONG ECONOMICALLY MARGINALIZED POPULATIONS

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ABSTRACT

Economically disadvantaged groups, including migrants, refugees, and low-income individuals, face a disproportionate burden of oral health problems due to persistent financial barriers, cultural marginalization, and limited access to preventive dental care. These challenges often undermine their ability to maintain routine oral hygiene, increasing vulnerability to periodontal disease and tooth loss, with consequences that extend beyond oral health to overall well-being. This study examines oral hygiene behaviors and periodontal health among socioeconomically marginalized patients attending the Department of Social Dentistry at the National Institute for Health, Migration, and Poverty (NIHMP) in Rome, Italy. Using a mixed-methods approach, data were collected through structured questionnaires (n = 170), qualitative interviews exploring oral hygiene habits, and clinical periodontal assessments (n = 70). The results reveal striking gaps in preventive oral care: 68% of participants used improper toothbrushing techniques, 45% reported inconsistent dental attendance, and 64% had moderate-to-severe periodontal disease. These findings suggest that insufficient daily oral hygiene is less a matter of individual behavior and more a manifestation of systemic inequities. The study emphasizes the urgent need for culturally informed, accessible, and community-based oral health interventions and highlights critical implications for clinical practice, public health policy, and equity-driven health reform.

KEYWORDS: *oral hygiene, dental health inequities, vulnerable populations, periodontal disease, community dental services, healthcare accessibility, preventive oral care, socioeconomic determinants, oral health promotion*

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INTRODUCTION

Despite oral health being an integral component of overall health and well-being, access to preventive dental care remains highly unequal across populations worldwide. Optimal oral hygiene practices, including regular tooth brushing, flossing, and professional visits, are essential for preventing common diseases such as dental caries and periodontal disease, thereby contributing fundamentally to overall health outcomes and quality of life (1). However, maintaining adequate oral hygiene is not equally feasible for all individuals. For economically marginalized groups, including refugees, asylum seekers, and low-income families, oral health represents a profound and often unmet need shaped by interlocking structural, cultural, and economic barriers (2).

The relationship between socioeconomic status (SES) and poor oral health outcomes has been extensively documented. Individuals from lower socioeconomic strata consistently exhibit elevated rates of untreated dental caries, severe periodontal disease, and premature tooth loss compared to their more privileged counterparts (3). These disparities emerge not solely from financial constraints but from a complex interplay of socioeconomic determinants, including inadequate public health infrastructure, insufficient health literacy, and chronic stress associated with displacement and acculturation (4).

Italy, as a major entry point for migrants into Europe, hosts a large and diverse population that frequently faces disrupted healthcare access, language barriers, and adaptation challenges. Despite Italy's universal health system, notable inequalities persist in dental care due to bureaucratic hurdles, cultural differences, and geographic accessibility issues (5). The NIHMP in Rome specifically addresses these gaps through its Department of Social Dentistry, providing an ideal setting to investigate the interactions among affordability, behavior, and oral health outcomes. This unique setting provides an essential framework for analyzing how affordability, health literacy, and culturally competent care influence oral hygiene behaviors within a high-income European context.

The present study seeks to generate evidence that can inform targeted public health strategies and policy reforms aimed at reducing oral health disparities. Specifically, it shows the frequency and consistency of oral hygiene routines among economically marginalized patients, examines how socioeconomic hardship influences neglect of oral care, and assesses the extent to which these structural determinants contribute to the development of edentulism and periodontal disease. Through this analysis, the research aims to advance understanding of the systemic forces shaping oral health behaviors among Italy's most vulnerable populations.

LITERATURE REVIEW

Theoretical Background

The scholarly understanding of oral hygiene disparities is fundamentally anchored in the Social Determinants of Health (SDH) framework, which posits that unequal resource distribution and social power are the structural root causes of poor health outcomes (6). Within this theoretical lens, oral health serves as a sensitive indicator of broader social inequality, reflecting how systemic material deprivation and debilitating psychosocial stress systematically impede self-care and access to preventive services (7). Locker's seminal work established that poverty simultaneously imposes financial constraints and emotional stressors, severely limiting the capacity for consistent preventive behavior. This concept is reinforced by the Common Risk Factor Approach (CRFA) (8), which demonstrates that inadequate oral hygiene shares core modifiable determinants, such as poor diet and stress, with other major chronic diseases, compelling the conclusion that effective intervention requires comprehensive social and policy strategies that target shared risk factors. Furthermore, the Life Course Perspective has provided critical longitudinal evidence, as demonstrated by the 32-year cohort study by Lawrence (9), which conclusively showed that individuals raised in persistent poverty were significantly more likely to suffer from severe periodontal disease and premature tooth loss in adulthood. These findings forcefully argue that childhood social conditions create deep, cumulative biological and behavioral disadvantages, forging enduring health inequalities that cannot be reversed solely through late-stage behavioral changes.

Empirical studies

Armfield (10) conducted a rigorous analysis of over 14,000 Australian adults, identifying financial hardship as the strongest predictor of delayed care and poor hygiene. This analysis established that financial hardship is the strongest predictor of both delayed dental care and poor hygiene behaviors, indicating a direct link between economic constraints and elevated clinical pathology. This financial barrier, however, is profoundly compounded by cultural and structural factors, particularly among migrant populations. The key structural tension is illuminated by a comparison of studies:

Marino's documentation (11) of the prevalence of severe disease among Vietnamese refugees, which was significantly shaped by cultural dissonance and acculturation, alongside Palencia's finding (12) that socioeconomic inequalities in service utilization persist across Europe despite the presence of universal healthcare systems. By synthesizing these two lines of inquiry, it becomes clear that poverty, cultural differences, and institutional barriers (e.g., linguistic obstacles) form an interlocking system that prevents functional access, regardless of formal service availability. This necessitates research that moves beyond simple prevalence counts to capture the dynamic interplay of culture, precarity, and institutional design. The crucial methodological shortfall in the existing body of work is the isolation of clinical outcomes from the necessary behavioral and psychosocial context; for example, studies like Figueiredo (13), which revealed an alarming 94% periodontal disease prevalence among the homeless, and the review by Keboa (5) on refugee oral health, which relied predominantly on self-reported measures, fails to link pathology robustly to underlying daily hygiene practices and chronic psychosocial determinants. This fragmentation is the precise gap this research aims to address. Recognizing the limitations of single-dimensional approaches, Watt and Sheiham (14) synthesize evidence indicating that culturally adapted, community-based interventions are twice as effective as conventional educational programs. This evidence supports a mixed-methods investigation linking clinical and behavioral findings.

MATERIALS AND METHODS

Study Design

This research adopted a cross-sectional mixed-methods design integrating quantitative and qualitative approaches to investigate the behavioral, socioeconomic, and cultural determinants of oral hygiene practices (15, 16). Data collection took place from January to July 2025 at the Department of Social Dentistry of the National Institute for Health, Migration, and Poverty (NIHMP) in Rome, a public health facility that provides free dental services to socially vulnerable populations (17).

A purposive stratified sampling strategy was used to recruit 170 participants, including both Italian and non-Italian individuals, to ensure broad demographic representation (18). All participants completed the structured questionnaire, and a subsample of 70 also underwent clinical periodontal assessment in accordance with established diagnostic standards (19). The convergent mixed-methods framework facilitated a more robust interpretation of the findings by triangulating quantitative patterns with qualitative narratives related to behavioral, psychosocial, and cultural influences (20).

INSTRUMENTS

To ensure methodological rigor and comprehensive data collection, the study employed three validated tools: a structured questionnaire, semi-structured interviews, and clinical periodontal examinations.

Structured questionnaire

A structured, researcher-administered questionnaire collected quantitative data on demographic characteristics, socioeconomic conditions, and oral hygiene behaviors, including toothbrushing frequency, flossing, mouthwash use, and dental attendance. It also collected information regarding chronic illnesses and prior dental diagnoses. The questionnaire was adapted from established oral health behavior assessment tools (21) and aligned with international public health survey standards. To ensure linguistic accuracy and cultural relevance, the instrument underwent a forward–backward translation procedure following Beaton (22), resulting in validated Italian, English, and Arabic versions. A pilot test involving 20 participants demonstrated high internal consistency (Cronbach's $\alpha = 0.82$).

Semi-structured interviews

Semi-structured qualitative interviews were conducted to complement the quantitative data and gain deeper insight into participants' perceptions, cultural barriers, migration-related experiences, and psychosocial stressors affecting oral hygiene routines. This approach provided rich contextual information and supported the thematic exploration of behavioral patterns and coping mechanisms (23, 24).

Clinical examination

A total of 70 participants underwent periodontal clinical examinations performed by trained dental professionals under aseptic conditions. Clinical assessments followed World Health Organization (WHO) criteria and the

American Academy of Periodontology diagnostic guidelines (19). Indicators measured included probing pocket depth (PPD), clinical attachment loss (CAL), bleeding on probing (BOP), and plaque index (PI). Calibration exercises were conducted before data collection to ensure strong inter-examiner agreement (Cohen's $\kappa > 0.85$). All participants provided informed consent, and the study adhered to the ethical principles of the Declaration of Helsinki (24).

Data analysis

Quantitative data were analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, frequencies, percentages, means, and standard deviations were used to summarize participant demographics and oral hygiene behaviors. Inferential statistical tests were then applied to examine associations between oral hygiene practices and sociodemographic characteristics. Independent-samples t-tests were used to compare two groups (e.g., gender, smoking status, or education level), whereas one-way ANOVA was used for variables with more than two categories, including clinical diagnoses. This analytical strategy enabled the identification of significant behavioral and socioeconomic predictors of oral hygiene outcomes (25, 26).

RESULTS

Descriptive statistics

The sample consists of 170 participants, including 95 males (55.9%) and 75 females (44.1%). Regarding age, 100 participants (58.8%) are younger than 50 years, while 70 participants (41.2%) are 50 years or older. With respect to nationality, 67 participants (39.4%) are Italian, whereas 103 (60.6%) are non-Italian. Regarding residence, 68 participants (40.0%) live in rural areas, and 102 (60.0%) live in urban areas. Regarding education, 90 participants (52.9%) have a high school degree or less, whereas 80 (47.1%) hold a university degree or diploma. With respect to employment, 72 participants (42.4%) are employed, whereas 98 (57.6%) are not. Regarding smoking habits, 84 participants (49.4%) are smokers, and 86 (50.6%) are non-smokers. Among participants with tooth loss, 91 (53.5%) had 1-8 extracted teeth, whereas 79 (46.5%) had more than 8. Regarding affordability, 57 participants (33.5%) reported that they could "sometimes" afford to purchase oral hygiene products, whereas 113 (66.5%) reported that they could "rarely" do so. With respect to overall stress levels, 89 participants (52.4%) reported high stress, whereas 81 (47.6%) reported moderate-to-low stress. Regarding oral hygiene habits, only 50 participants (29.4%) report cleaning their teeth regularly, whereas 120 (70.6%) do not. Similarly, 23 participants (13.5%) use dental floss, and 147 (86.5%) do not. Regarding mouthwash use, 49 participants (28.8%) reported using it, whereas 121 (71.2%) did not. Finally, only 48 participants (28.2%) visit the dentist regularly, whereas 122 (71.8%) rarely do so (Table I) (Fig. 1-7).

Table I. *Descriptive analysis of the variables of the study (n=170).*

Variable	Category	Count	Percentage
General Information			
Gender	Male	95	55.9%
	Female	75	44.1%
Age Group	< 50	100	58.8%
	≥ 50	70	41.2%
Nationality	Italian	67	39.4%
	Non-Italian	103	60.6%
Residence Area	Rural	68	40.0%
	Urban	102	60.0%
Educational Level	High School (or less)	90	52.9%
	University Graduate-Diploma	80	47.1%
Working	Yes	72	42.4%
	No	98	57.6%
Smoking Status	Yes	84	49.4%
	No	86	50.6%
Number of Extracted Teeth	1 – 8	91	53.5%
	> 8	79	46.5%
Affordability of Oral Hygiene Products	Yes – Sometimes	57	33.5%
	No – Rarely	113	66.5%
Overall Stress Level	High	89	52.4%
	Moderate – Rare	81	47.6%

Oral Hygiene Habits			
Teeth Cleaning Regularly	Yes	50	29.4%
	No	120	70.6%
Use of Dental Floss	Yes	23	13.5%
	No	147	86.5%
Use of Mouthwash	Yes	49	28.8%
	No	121	71.2%
Regular Dental Visits	Yes – Sometimes	48	28.2%
	No – Rarely	122	71.8%

Participants Demographics (Fig. 1-3).

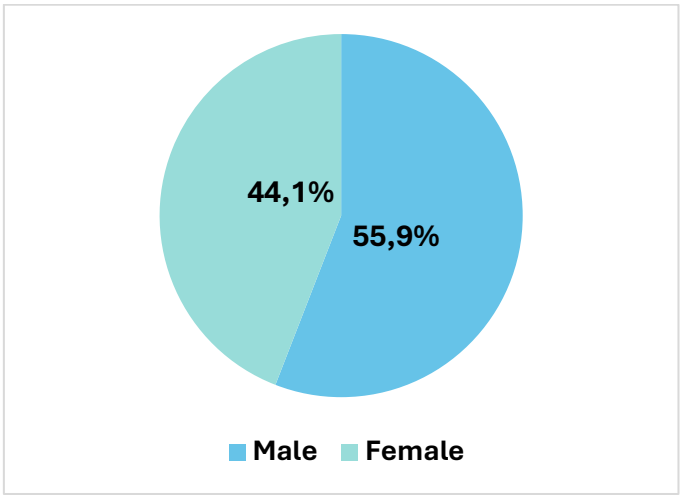


Fig. 1. *Distribution of participants by gender*

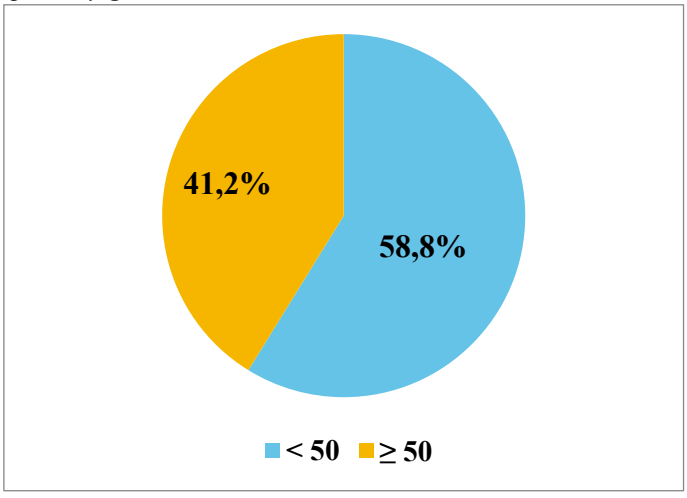


Fig. 2. *Distribution of participants by age*

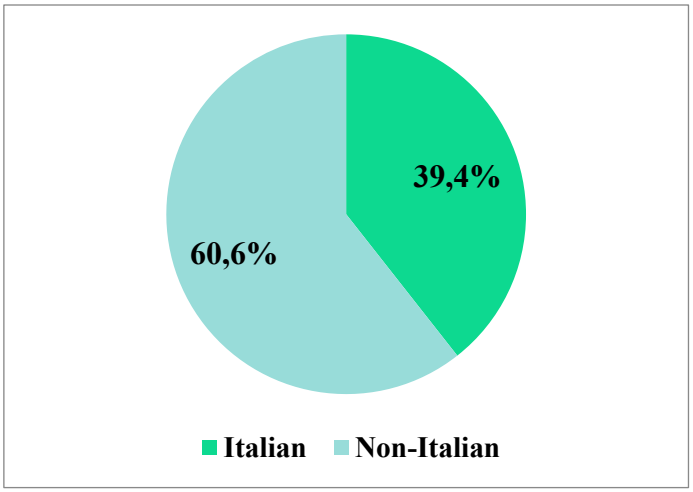


Fig. 3. *Distribution of participants by nationality*

Oral hygiene behaviors (Fig. 4-7).

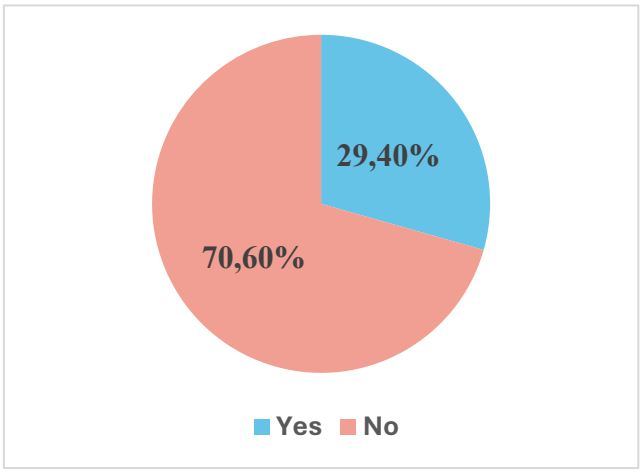


Fig. 4. *Distribution of participants by tooth-brushing habit.*

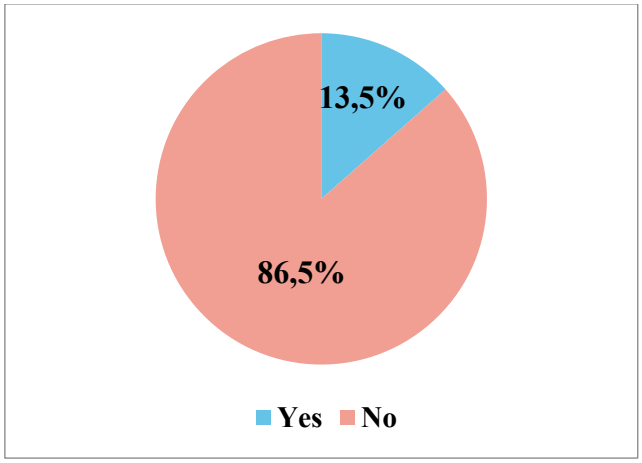


Fig. 5. *Distribution of participants by tooth-flossing habit.*

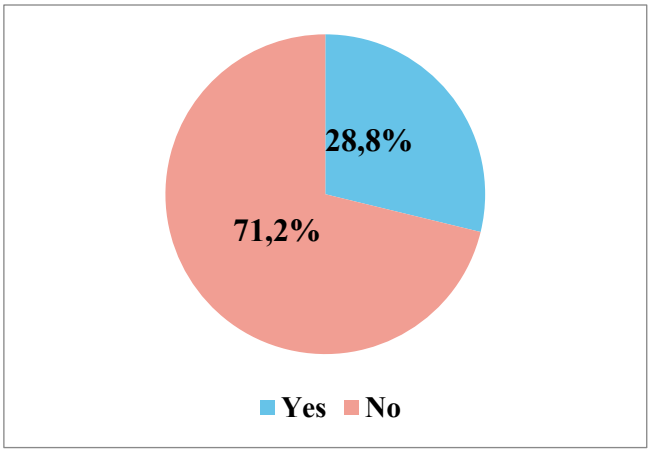


Fig. 6. *Distribution of participants by mouthwash use habit.*

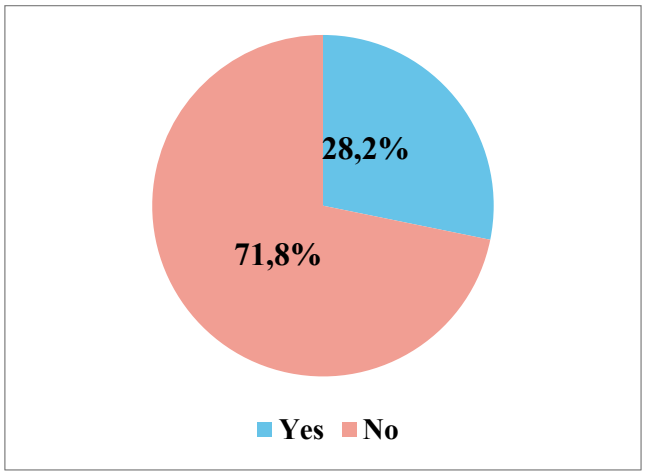


Fig. 7. *Distribution of participants by regular dental visits.*

Periodontal health status

The diagnostic classification of periodontal conditions in this study was based on the standardized parameters established by the American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP) during the 2018 World Workshop (20). Probing depth (PD) and clinical attachment loss (CAL) were measured at six sites per tooth using WHO-calibrated periodontal probes under aseptic conditions. Radiographic bone loss was assessed using digital imaging and expressed as a percentage of root length. Gingivitis was characterized by inflammation confined to the gingival tissues without attachment or bone loss. Periodontitis was classified as mild, moderate, or severe depending on the extent of attachment and bone loss, with increasing severity corresponding to deeper periodontal pockets, greater clinical attachment loss, and radiographically visible bone resorption. This standardized framework ensured consistency in diagnosis and comparability with international epidemiological data.

The diagnosis of gingivitis and periodontitis was based on standard clinical and radiographic criteria. Gingivitis was identified in cases with a probing depth of ≤3 mm, no attachment loss, and no radiographic bone loss, indicating inflammation limited to the gingival tissues. Mild periodontitis was diagnosed when the probing depth ranged from 4–5 mm, with 1–2 mm of attachment loss and <15% bone loss, reflecting the early stages of periodontal destruction. Moderate periodontitis was defined by pocket depths of 5–6 mm, 3–4 mm of attachment loss, and 15–33% bone loss, while severe periodontitis was characterized by pockets ≥7 mm, attachment loss ≥5 mm, and bone loss exceeding 33%, often accompanied by tooth mobility (Table II).

Table II. *Summary of diagnostic criteria for periodontal conditions*

Condition	Probing Depth (PD)	Clinical Attachment Loss (CAL)	Radiographic Bone Loss	Key Feature
Gingivitis	≤ 3 mm	0 mm	Absent	Inflammation only (reversible)
Mild Periodontitis	4–5 mm	1–2 mm	<15% (Coronal third)	Initial attachment loss
Moderate Periodontitis	5–6 mm	3–4 mm	15–33% (Mid-root)	Moderate supporting tissue loss
Severe Periodontitis	≥ 7 mm	≥ 5 mm	>33% (Beyond mid-root)	Advanced attachment loss, tooth mobility

Diagnostic criteria used to classify periodontal conditions based on probing depth (PD), clinical attachment loss (CAL), and radiographic bone loss. Gingivitis represents a reversible inflammatory condition with no attachment loss, whereas mild, moderate, and severe periodontitis indicate progressive tissue and bone destruction. These criteria were applied following the 2017 World Workshop classification of periodontal and peri-implant diseases and conditions (19).

In this study, which included 70 participants, periodontal examinations revealed varying degrees of periodontal conditions. Among the participants, 16 individuals (22.8%) were diagnosed with gingivitis, characterized by mild gum inflammation without bone loss. Nine participants (12.9%) presented with mild periodontitis, showing early signs of attachment and bone loss. Moderate periodontitis was observed in 25 individuals (35.7%), indicating more advanced tissue destruction and pocket formation. Meanwhile, 20 participants (28.6%) were diagnosed with severe periodontitis, showing significant attachment loss, deep periodontal pockets, and evident bone resorption (27) (Table III, Fig. 8).

Table III. *Descriptive analysis for the variables of the study (n=70).*

Periodontal Diagnose	Gingivitis	16	22.8%
	Mild Periodontitis	9	12.9%
	Moderate Periodontitis	25	35.7%
	Severe Periodontitis	20	28.6%

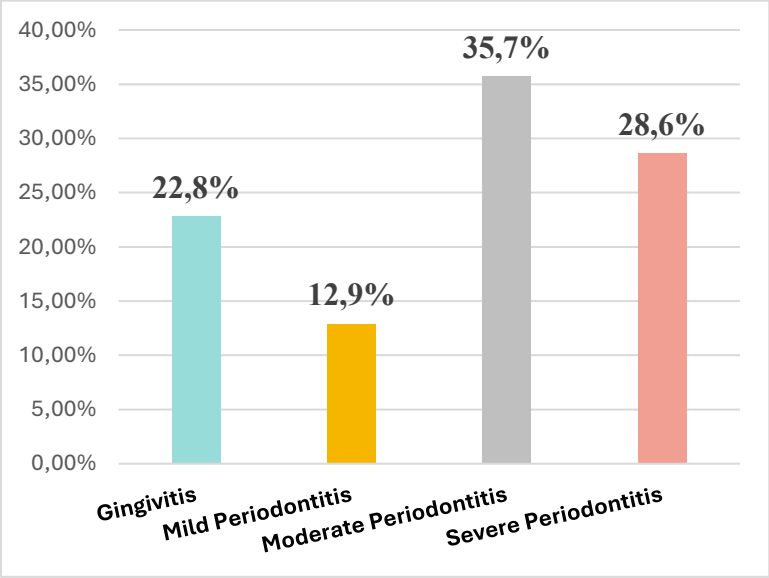


Fig. 8. *Distribution of participants who were clinically examined by a periodontal diagnosis.*

Comparative analysis

Gender, age, nationality, residence, and affordability significantly affected oral hygiene behavior ($p < 0.05$). Urban residents, Italians, and participants with part-time jobs or higher income levels exhibited better oral hygiene and dental attendance, whereas non-Italians and low-income individuals exhibited higher rates of neglect. Stress level analysis

revealed a paradoxical trend where participants reporting higher stress maintained more frequent brushing and dental visits (Table IV, V, VI).

Table IV. *Comparison of oral hygiene habits by gender using an independent samples t-test.*

Gender / Oral Hygiene Habit	Male (n_1=95)	Female (n_2=75)	p-Value
Teeth Cleaning Regularly	40 (42.1%)	10 (13.3%)	-4.280 (0.000)
Use of Dental Floss	20 (21.1%)	3 (4.0%)	-3.312 (0.001)
Use of Mouthwash	11 (11.6%)	38 (50.7%)	6.147 (0.000)
Regular Dental Visits	38 (40.0%)	10 (13.3%)	-3.989 (0.000)

The table above reveals significant gender differences in oral hygiene habits among participants. Male participants were more likely than females to clean their teeth regularly ($p < 0.001$). Similarly, a higher proportion of males reported using dental floss than females ($p = 0.001$). In contrast, females reported using mouthwash more frequently than males ($p < 0.001$). Additionally, regular dental visits were more common among males than females, with this difference being statistically significant ($p < 0.001$).

Table V. *Comparison of oral hygiene habits by age group using an independent samples t-test.*

Age Group / Oral Hygiene Habit	< 50 (n_1=100)	≥ 50 (n_2=70)	p-Value
Teeth Cleaning Regularly	61 (61.0%)	11 (15.7%)	-3.368 (0.001)
Use of Dental Floss	15 (15.0%)	8 (11.4%)	-0.667 (0.506)
Use of Mouthwash	18 (18.0%)	31 (44.3%)	3.863 (0.000)
Regular Dental Visits	36 (36.0%)	12 (17.1%)	-2.731 (0.007)

This table shows significant differences in oral hygiene habits across age groups. Participants under 50 years were more likely to clean their teeth regularly and attend dental checkups, with both differences being statistically significant ($p < 0.01$). The use of mouthwash, however, was significantly higher among participants aged 50 years and above ($p < 0.001$). No significant difference was observed between the two age groups in the use of dental floss ($p > 0.05$) (Fig. 9).

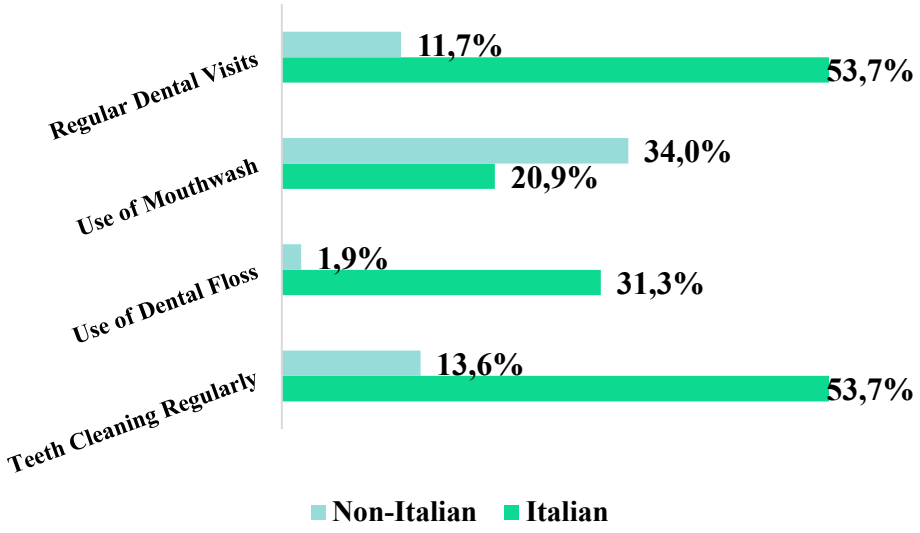


Fig. 9. D*istribution of oral hygiene habits by nationality.*

Table VI. *Comparison of oral hygiene habits by nationality using an independent samples t-test.*

Nationality / Oral Hygiene Habit	Italian (n_1=67)	Non-Italian (n_2=103)	p-Value
Teeth Cleaning Regularly	36 (53.7%)	14 (13.6%)	-6.182 (0.000)
Use of Dental Floss	21 (31.3%)	2 (1.9%)	-5.999 (0.000)
Use of Mouthwash	14 20.9%	35 (34.0%)	1.848 (0.066)
Regular Dental Visits	36 (53.7%)	12 (11.7%)	-6.656 (0.000)

Table VI demonstrates significant differences in oral hygiene habits between Italian and non-Italian participants. Italians were more likely to clean their teeth, use dental floss, and visit the dentist, with all differences statistically significant ($p < 0.001$). In contrast, no significant difference was found between the two groups in mouthwash use ($p > 0.05$).

Table VII indicates significant differences in oral hygiene habits between participants living in urban and rural areas. Urban residents were more likely to clean their teeth regularly, use dental floss, and visit the dentist for regular checkups, with all differences being statistically significant ($p < 0.001$). However, the difference in mouthwash use between the two groups was not statistically significant ($p > 0.05$).

Table VII. *Comparison of oral hygiene habits by residence area using an independent samples t-test.*

Residence Area / Oral Hygiene Habit	Urban (n_1=68)	Rural (n_2=102)	p-Value
Teeth Cleaning Regularly	32 (47.1%)	18 (17.6%)	-4.320 (0.000)
Use of Dental Floss	21 (30.9%)	2 (2.0%)	-5.899 (0.000)
Use of Mouthwash	14 (20.6%)	35 (34.3%)	1.946 (0.053)
Regular Dental Visits	35 (51.5%)	13 (12.7%)	-6.024 (0.000)

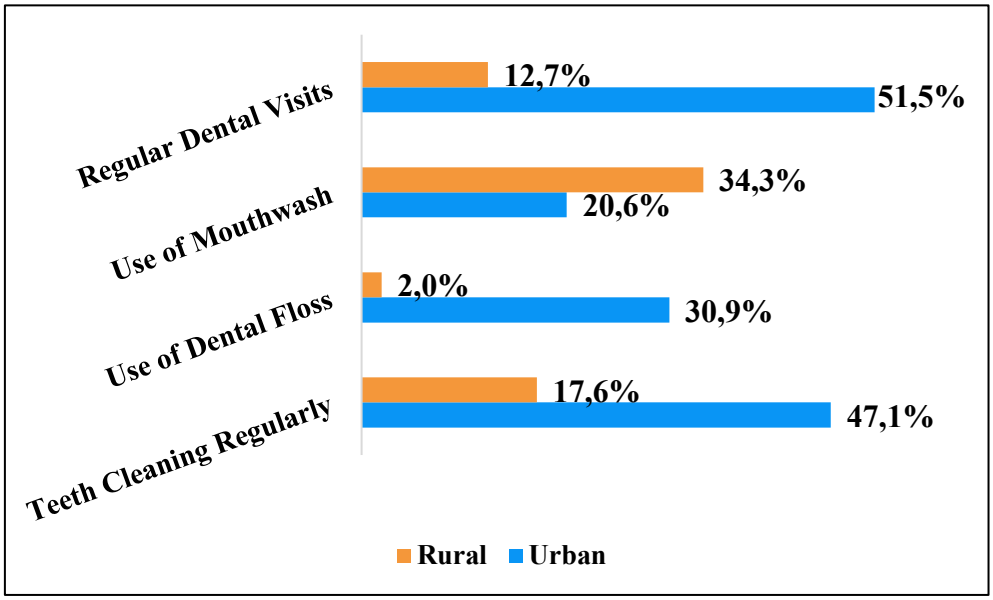


Fig. 10. *Distribution of oral hygiene habits by residence level.*

Table VIII. *Comparison of oral hygiene habits by educational level using an independent samples t-test.*

Educational Level / Oral Hygiene Habit	High School (or less) (n_1=90)	University Graduate-Diploma (n_2=80)	p-Value
Teeth Cleaning Regularly	39 (43.3%)	11 (13.8%)	-4.440 (0.000)
Use of Dental Floss	16 (17.8%)	7 (8.8%)	-1.723 (0.087)
Use of Mouthwash	16 (17.8%)	33 (41.3%)	3.471 (0.001)
Regular Dental Visits	33 (36.7%)	15 (18.8%)	-2.627 (0.009)

Table VIII shows that the educational level is significantly associated with certain oral hygiene habits. Participants with a high school education or less were more likely to clean their teeth regularly and attend dental checkups, with both differences being statistically significant ($p < 0.01$). Conversely, mouthwash use was significantly higher among university graduates and diploma holders ($p = 0.001$). No significant difference was observed between the two groups regarding dental floss use ($p > 0.05$).

Table IX. *Comparison of oral hygiene habits by occupation using an independent samples t-test.*

Working / Oral Hygiene Habit	Yes (n_1=72)	No (n_2=98)	p-Value
Teeth Cleaning Regularly	42 (58.3%)	8 (8.2%)	-8.405 (0.000)
Use of Dental Floss	18 (25.0%)	5 (5.1%)	-3.890 (0.000)
Use of Mouthwash	3 (4.2%)	46 (46.9%)	6.838 (0.000)
Regular Dental Visits	35 (48.6%)	13 (13.3%)	-5.456 (0.000)

Table IX reveals statistically significant differences in oral hygiene habits between participants with and without jobs. Those who reported having a job were more likely to clean their teeth regularly, use dental floss, and visit the dentist for regular checkups; all differences were statistically significant ($p < 0.001$). In contrast, the use of mouthwash was significantly higher among unemployed participants ($p < 0.001$).

Table X. *Comparison of oral hygiene habits by smoking status using an independent samples t-test.*

Smoking Status / Oral Hygiene Habit	Yes (n_1=84)	No (n_2=86)	p-Value
Teeth Cleaning Regularly	39 (46.4%)	11 (12.8%)	-5.148 (0.000)
Use of Dental Floss	19 (22.6%)	4 (4.7%)	-3.528 (0.001)
Use of Mouthwash	10 (11.9%)	39 (45.3%)	5.149 (0.000)
Regular Dental Visits	40 (47.6%)	8 (9.3%)	-6.096 (0.000)

Table X presents the relationship between oral hygiene habits and participants' smoking status. The results indicate that smokers reported cleaning their teeth and visiting the dentist more frequently than non-smokers. Conversely, non-smokers reported greater use of mouthwash than smokers. The use of dental floss was also more common among smokers than non-smokers. All observed differences between smokers and non-smokers were statistically significant ($p < 0.05$) (Fig. 11).

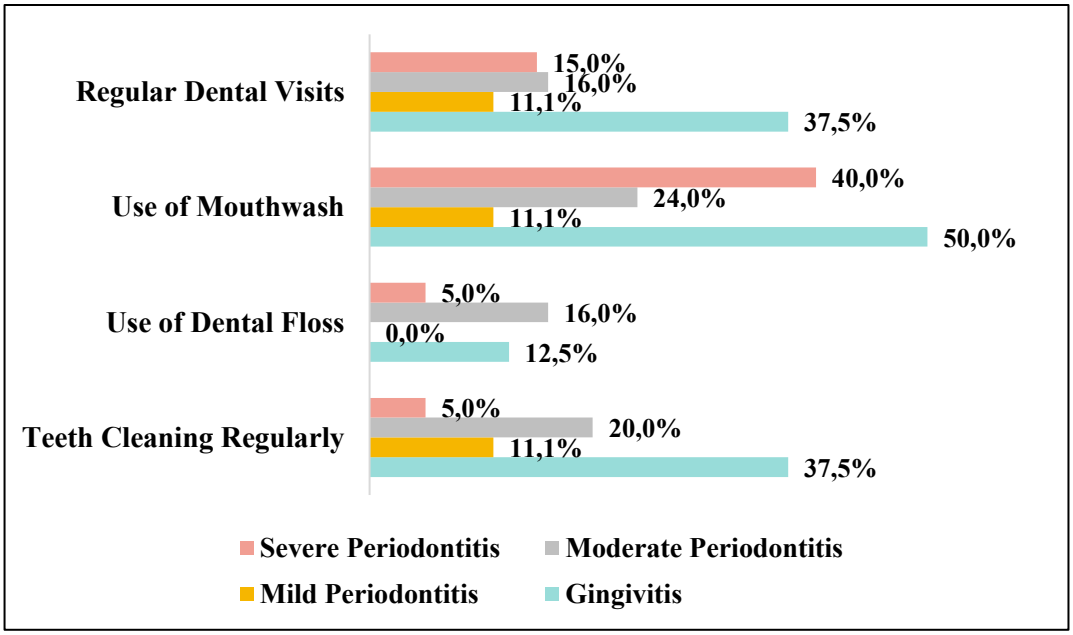


Fig. 11. *Distribution of oral hygiene habits by periodontal diagnoses.*

Table XI. *Comparison of oral hygiene habits by periodontal diagnoses using one-way ANOVA.*

Oral Hygiene Routine / Dental Diagnose	Teeth Cleaning Regularly	Use of Dental Floss	Use of Mouthwash	Regular Dental Visits
Gingivitis (n_1=16)	6 (37.5%)	2 (12.5%)	8 (50.0%)	6 (37.5%)
Mild Periodontitis (n_2=9)	1 (11.1%)	0 (0.0%)	1 (11.1%)	1 (11.1%)
Moderate Periodontitis (n_3=25)	5 (20.0%)	4 (16.0%)	6 (24.0%)	4 (16.0%)
Severe Periodontitis (n_4=20)	1 (5.0%)	1 (5.0%)	8 (40.0%)	3 (15.0%)
p-Value	3.003 (0.020)	0.821 (0.513)	1.709 (0.150)	1.823 (0.127)

Fig. 11 and Table XI show the relationship between oral hygiene habits and participants' dental diagnoses. The findings reveal a significant difference in regular teeth cleaning across diagnostic groups ($p = 0.020$), with individuals diagnosed with gingivitis and those without any diagnosis tending to clean their teeth more frequently. However, no significant differences were observed among the groups in the use of dental floss, mouthwash, or regular dental visits ($p > 0.05$) (Fig. 12, 13).

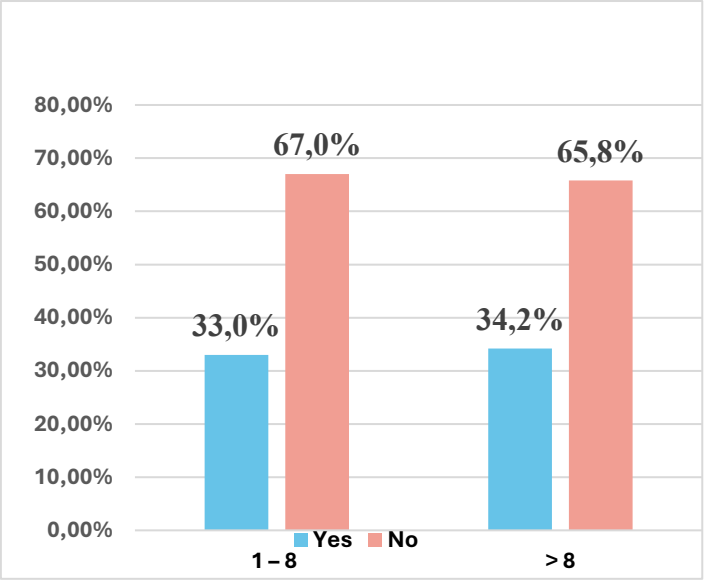


Fig. 12. *Distribution of the number of extracted teeth by the affordability of oral hygiene products.*

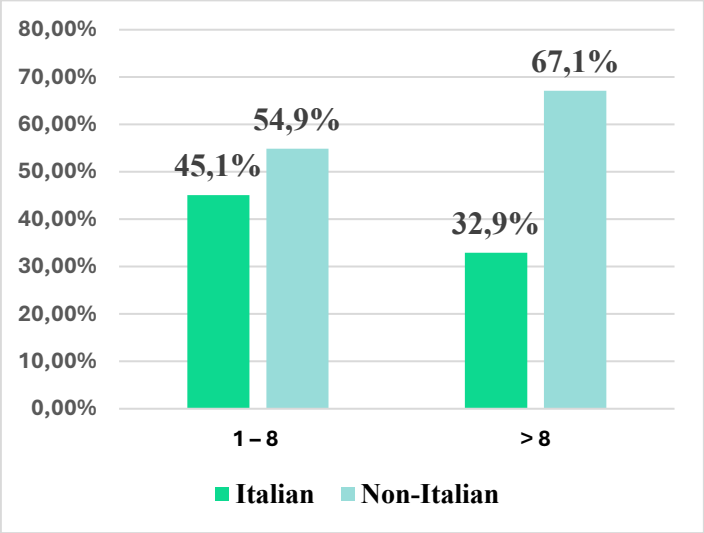


Fig. 13. *Distribution of the number of extracted teeth by nationality.*

Table XII. *Comparison of oral hygiene habits by number of extracted teeth using an independent samples t-test*

Number of Extracted Teeth / Oral Hygiene Habit	1 – 8 (n_1=91)	> 8 (n_2=79)	p-Value
Teeth Cleaning Regularly	32 (35.2%)	18 (22.8%)	-1.773 (0.078)
Use of Dental Floss	12 (13.2%)	11 (13.9%)	0.139 (0.889)
Use of Mouthwash	26 (28.6%)	23 (29.1%)	0.077 (0.938)
Regular Dental Visits	31 (34.1%)	17 (21.5%)	-1.820 (0.071)

Table XII presents the relationship between oral hygiene habits and the number of extracted teeth among participants (29). The results indicate no statistically significant differences in oral hygiene habits between individuals with 1–8 extracted teeth and those with more than 8 extracted teeth ($p > 0.05$). Although participants with fewer extracted teeth appeared slightly more likely to clean their teeth regularly and visit the dentist, these differences did not reach statistical significance (Fig. 14).

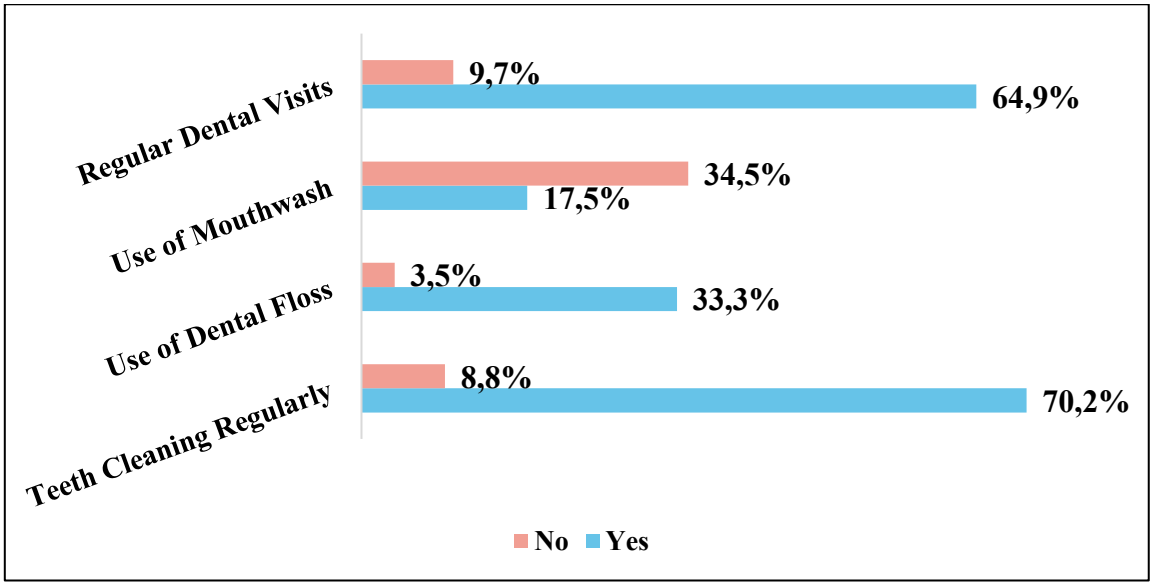


Figure 14. *Distribution of oral hygiene habits by the affordability of oral hygiene products.*

Table XIII. *Comparison of oral hygiene habits by affordability to buy oral hygiene products using the t-test*

Affordability of Oral Products / Oral Hygiene Habit	Yes (n_1=57)	No (n_2=113)	p-Value
Teeth Cleaning Regularly	40 (70.2%)	10 (8.8%)	-10.665 (0.000)
Use of Dental Floss	19 (33.3%)	4 (3.5%)	-5.847 (0.000)
Use of Mouthwash	10 (17.5%)	39 (34.5%)	2.329 (0.021)
Regular Dental Visits	37 (64.9%)	11 (9.7%)	-9.197 (0.000)

Table XIII shows the relationship between oral hygiene habits and participants' ability to afford oral hygiene products. The findings reveal significant differences across all oral hygiene behaviors. Participants who could afford to purchase oral hygiene products were considerably more likely to clean their teeth regularly, use dental floss, and visit the dentist than those who could not. However, participants with limited affordability reported a slightly higher tendency to use mouthwash.

Table XIV. *Comparison of oral hygiene habits by overall stress level using an independent samples t-test.*

Overall Stress Level / Oral Hygiene Habit	High (n_1=89)	Moderate - Rare (n_2=81)	p-Value
Teeth Cleaning Regularly	37 (41.6%)	13 (16.0%)	-3.777 (0.000)
Use of Dental Floss	16 (18.0%)	7 (8.6%)	-1.784 (0.076)
Use of Mouthwash	15 (16.9%)	34 (42.0%)	3.737 (0.000)
Regular Dental Visits	34 (38.2%)	14 (17.3%)	-3.093 (0.002)

Table XIV presents the comparison between oral hygiene habits and participants' overall stress levels. The results indicate significant differences for most habits. Participants with high stress levels were more likely to clean their teeth regularly and attend dental visits, whereas those with moderate-to-rare stress levels reported greater use of mouthwash. No significant difference was observed in the use of dental floss between the two groups.

DISCUSSION

This study explored the multifaceted determinants influencing oral hygiene behaviors among economically marginalized individuals attending the NIHMP Department of Social Dentistry in Rome. Findings revealed that socioeconomic status, cultural background, gender, and psychological stress were critical determinants shaping oral hygiene practices, including brushing, flossing, and dental attendance. Overall, preventive oral care engagement was limited; only 29.4% of participants reported regular brushing, 13.5% used dental floss, and 28.2% attended dental check-ups, underscoring the persistent inequities in oral health behaviors among low-income and migrant populations (28, 29).

Economic affordability emerged as a central determinant of oral hygiene practices, highlighting how economic conditions directly shape preventive behaviors. Participants who could purchase basic hygiene products demonstrated significantly better oral care habits than those who could not. This pattern aligns with Harnagea's (30) conclusion that financial constraints compel low-income individuals to prioritize immediate needs, such as food and rent, over dental supplies. In this context, the inability to afford a toothbrush or toothpaste represents a deeper form of material deprivation that undermines autonomy and basic self-care. Although Italy's healthcare system is grounded in universalism, this study demonstrates that bureaucratic, linguistic, and cultural barriers hinder equitable access for migrants and asylum seekers. These findings are consistent with Listl, whose research indicates that income-based inequalities remain entrenched in high-income nations despite formal guarantees of care (30-32).

Cultural and national background also played a substantial role in shaping oral hygiene behaviors. Italian participants reported more consistent preventive practices than non-Italians, reflecting persistent disparities linked to migration-related challenges. Prior research has shown that migrants across Europe often face linguistic, cultural, and structural barriers that impede their ability to adopt regular oral hygiene routines or seek dental care (33, 34). In contrast, Peterson (1) noted progress in reducing oral health inequalities in certain European contexts through integrated chronic disease prevention strategies. The results of the present study suggest that such integration has not been fully achieved in Italy, and that culturally and linguistically appropriate outreach remains insufficient. The NIHMP's use of cultural mediators demonstrates that targeted, multilingual support can meaningfully enhance accessibility; however, this practice has not been widely scaled nationally.

The study also revealed an unexpected pattern in gender-related behaviors. Contrary to broader European trends, where women typically engage more frequently in preventive oral hygiene (31, 35). Male participants in this cohort reported more regular brushing and dental visits. This deviation likely reflects the intersecting forms of disadvantage experienced by women in the sample. Many female participants were engaged in unpaid domestic work, had limited financial independence, or faced cultural norms that restricted their access to resources. Conversely, male participants were somewhat more likely to engage in part-time work and to have autonomy over small discretionary spending, which allowed greater consistency in oral hygiene practices. This context-dependent gender difference underscores the need to interpret oral health behaviors through a lens of intersectional socioeconomic constraints rather than generalized assumptions.

Psychological stress produced a noteworthy and counterintuitive effect. Participants experiencing higher stress reported more frequent brushing and dental visits than those with moderate stress. Although stress is typically associated with poorer oral health outcomes (36). The present findings suggest that, within highly vulnerable populations, stress may sometimes stimulate adaptive behaviors. This aligns with the concept of "resilient coping", where individuals channel distress into protective routines aimed at maintaining dignity and a sense of control (29). Several participants reported that maintaining oral hygiene was one of the few stable habits they could maintain amid uncertainty. However, the sustainability of this adaptive response remains unclear and warrants further longitudinal investigation.

Taken together, the findings underscore that oral hygiene neglect among economically disadvantaged and migrant populations cannot be explained by individual attributes alone. Instead, oral health behaviors must be situated within the broader social, economic, and psychological landscapes that shape daily life. The alignment strengthens evidence that economic factors are primary determinants of oral hygiene globally, while the contrasts with Listl and Petersen illustrate that gender patterns and migration-related disparities vary across sociopolitical environments (1, 30, 31, 37-39).

These convergences and divergences collectively point to the need for localized, culturally adapted, and structurally informed public health strategies. Ultimately, improving oral hygiene among vulnerable groups requires a shift from individually targeted interventions to comprehensive social policies that confront poverty, discrimination, precarious housing, and limited access to culturally competent care. Only through such structural reforms can lasting and equitable improvements in oral health outcomes be achieved (Fig. 15).

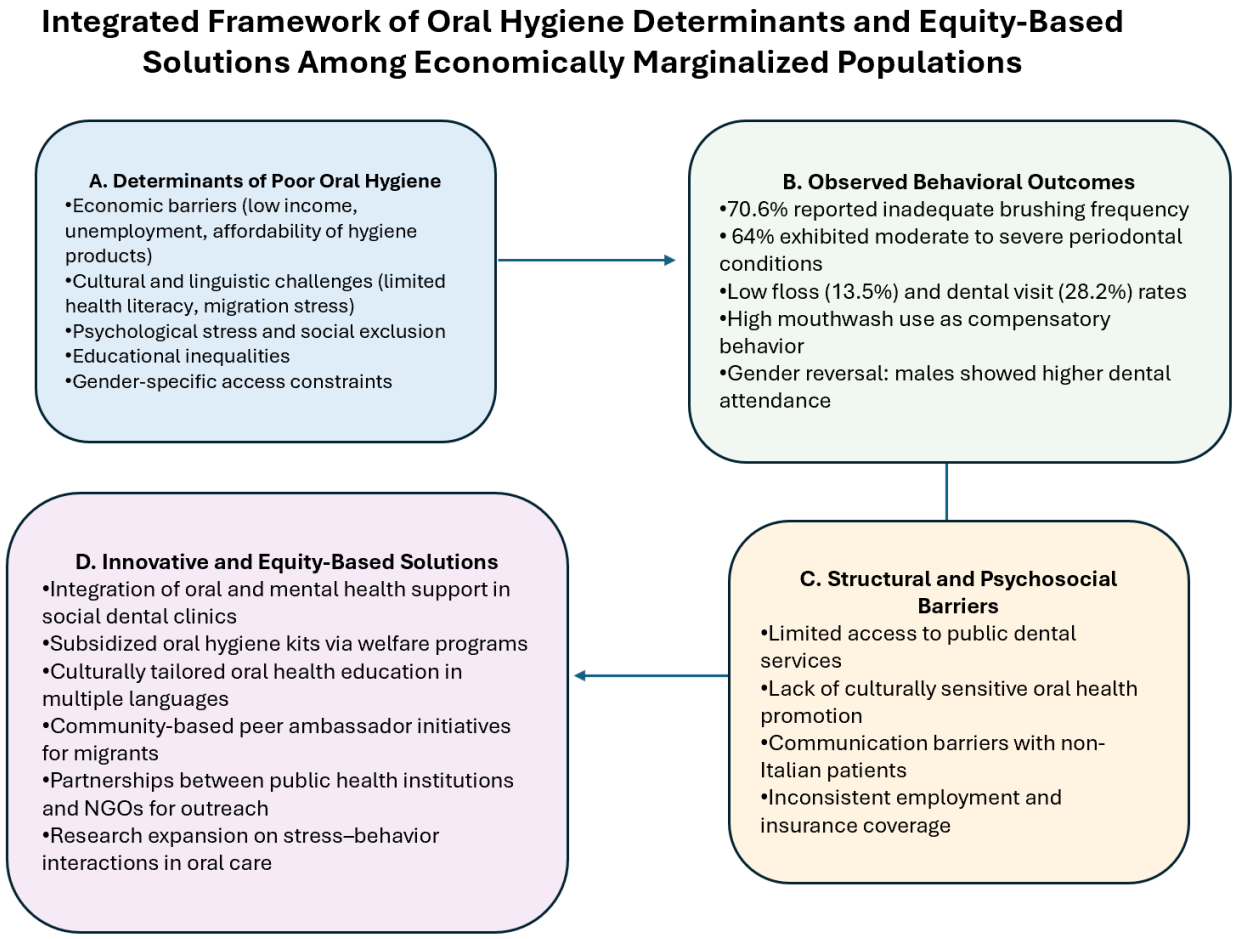


Fig. 15. *Conceptual framework illustrating the interconnected determinants, behavioral outcomes, structural barriers, and equity-based solutions influencing oral hygiene practices among economically marginalized populations in Rome, Italy.*

CONCLUSIONS

This study demonstrates that inadequate oral hygiene among socially and economically disadvantaged populations is not the result of individual neglect but a predictable consequence of structural inequities. Poverty, cultural displacement, limited access to resources, and the psychological strain associated with precarious living conditions collectively shape the capacity for preventive oral care. These findings highlight the need for health systems to move beyond traditional, behavior-focused models and adopt comprehensive strategies that integrate oral health promotion with broader social policies, educational initiatives, and mental health support. Within this context, the NIHMP model offers a compelling example of how public institutions can deliver accessible, culturally sensitive, and equity-oriented dental care. Its approach illustrates the potential for integrated services to mitigate systemic barriers and improve outcomes among vulnerable groups. Ultimately, advancing oral health equity requires reimagining oral hygiene as a social right rather than a personal responsibility and addressing the structural forces that constrain individuals' ability to maintain self-care. Sustainable progress will depend on coordinated policy reforms that target the root causes of vulnerability, ensuring that the conditions necessary for oral health are accessible to all.

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