Appendix. Comparison of the effects of periodontal diseases on oral health-related quality of life across included studies

Study title	Journal	Author, publication year, country	Study design	Sample size	Age (years)	Evaluation flow	Calibration	Participants	Periodontal examination/probe used	Sociodemographic/ confounding variables	Quality of Life (QoL)[iv] Measure and Questionnaire	QoL significance with periodontal outcomes	Specific results about domains of OHIP-14	Other findings	Limitations
Evaluation of the effects of periodontal status according to 2017 classifications on oral health-related to general health: A cross-sectional study	International Journal of Dental Hygiene	Dikilitaş et al., 2024, Türkiye	A cross-sectional study	166	Age range: 22–57	1. Periodontal examination (conducted by a calibrated periodontist) 2. Questionnaire (administered by a single clinician)	Calibration with 10 non-study periodontitis patients. Periodontal probing depth (PD):[c] • Intra-examiner agreement - 0.82 clinical attachment level (CAL):[d] • Intra-examiner agreement - 0.74.	44 patients with clinical periodontal health and intact periodontium (IP-CPH) 42 patients with clinical periodontal health with reduced periodontium (RP-CPH) 44 patients with gingivitis (G) 36 patients with Stage I periodontitis (SI-P)	Plaque Index (PI),[v] Gingival Index (GI),[vi] Bleeding on Probing (BoP),[vii] PD, and CAL assessed using a periodontal probe (Hu-Friedy)	Age, gender	Turkish version of Oral Health Impact Profile-14 (OHIP-14),[viii] and Short Form (36) Health Survey (SF-36)[ix]	• All periodontal parameters increased significantly from the gingival health (intact periodontium) group to the Stage I periodontitis group. • A significant rise was observed, from 1.09 in the gingival health with intact periodontium group to 13.03 in Stage I periodontitis, reflecting a marked decline in Oral Health-Related Quality of Life (OHRQoL).[xvi] • Patients with high CAL showed significantly worse outcomes across all OHIP-14 domains.	• All OHIP-14 domains showed significant increases across the groups, with the highest scores observed in Stage I periodontitis (p<0.001). • The physical pain subdomain showed the strongest positive correlations with periodontal indicators, particularly PI, GI, and BoP (p<0.001).	• All SF-36 subscales showed significant negative correlations with OHIP-14 domains. • All SF-36 subscales also demonstrated negative correlations with periodontal parameters, particularly CAL and PD.	• Exclusion of Stage II, III, and IV periodontitis • Relatively small sample size • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases
Food intake, masticatory function, tooth mobility, loss of posterior support, and diminished quality of life are associated with more advanced periodontitis stage diagnosis	Journal of Clinical Periodontology	Uy et al., 2022, China	A cross-sectional study	214	Age range: 30–63	1. Questionnaire (administered by a trained nurse) 2. Periodontal examination (conducted by a trained and calibrated investigator)	PD: • Inter-examiner agreement - 0.83* CAL: • Inter-examiner agreement - 0.77*	51 patients with Stage I periodontitis 50 patients with Stage II periodontitis 55 patients with Stage III periodontitis 58 patients with Stage IV periodontitis or 49 patients with Grade A periodontitis 105 patients with Grade B periodontitis 60 patients with Grade C periodontitis	BoP, PD, CAL, furcation involvement (FI),[x] tooth mobility, missing teeth, and Decayed, Missing, and Filled Teeth index (DMFT)[xi] (probe type not specified)	Age, gender, smoking status, body mass index, handgrip strength, diabetes status	Cantonese version of OHIP-14 and a validated masticatory dysfunction questionnaire	• OHIP-14 scores were significantly higher in patients with advanced-stage diagnosis, particularly Stage IV periodontitis (p<0.001).	• No specific results regarding domains were highlighted.	• Patients with advanced periodontitis reported reduced food intake and altered food choices due to difficulty chewing. • The prevalence of diabetes was significantly higher in more advanced stages, especially in Stage IV (72.2%) (p<0.001). • Body mass index (BMI)[xvii] increased significantly with periodontitis severity, from Stage I (21.19) to Stage III (23.88) (p=0.005). • Handgrip strength decreased significantly from Stage I to Stage III, indicating reduced physical function in advanced disease (p=0.002). • DMFT scores were significantly higher in advanced stages, particularly in Stage IV.	• Inclusion of patients with lower socioeconomic status • Small subgroup size for patient with diabetes • Limitations of the DMFT index • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases
Periodontitis in a 65-year-old population: risk indicators and impact on oral health-related quality of life	BMC Oral Health	Søstal et al., 2022, Norway	A cross-sectional study	453	65	1. Questionnaire (administered) 2. Periodontal and radiographic examination (conducted by two trained and calibrated dentists)	PD: • Intraclass correlation coefficient (ICC)[iii] - 0.82 (calibrated with seven patients) Radiographic bone loss: • Intra-examiner agreement - 0.88 • Inter-examiner agreement - 0.79 Staging periodontitis: • Inter-examiner agreement - 0.90 • Inter-examiner agreement - 0.72	215 patients with no periodontitis 75 patients with Stage II periodontitis 163 patients with Stage III or IV periodontitis	BoP, PD, FI, missing teeth, and tooth mobility (probe type not specified)	Gender, country of birth, education level, type II diabetes, smoking habits, dental attendance pattern, tooth-brushing habits	Norwegian version of OHIP-14	• A statistically significant increase in OHIP-14 scores was found between individuals without periodontitis and those with severe periodontitis (Stage III or IV) (p<0.05).	• Advanced periodontitis (Stages III/IV) was associated with worsened OHRQoL across multiple domains (physical pain, psychological discomfort, psychological disability, and handicap). • Among all domains, physical pain was the most affected by the severity of periodontal disease.	• Being born in a Western country was associated with lower odds of severe periodontitis (odds ratio, OR:[xviii] 0.4). • Having Type II diabetes increased the likelihood of severe periodontitis by 2.5 times. • Current smokers had 5.8 times higher odds of developing severe periodontitis. • Former smokers had 1.9 times higher odds of developing severe periodontitis.	• Combined categorization of Stage III and IV periodontitis • Specific age range • Participants from a sociodemographically advantaged location • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases
Impact of stage-grade of periodontitis and self-reported symptoms on oral health-related quality of life	International Journal of Dental Hygiene	Yilmaz et al., 2022, Türkiye	A cross-sectional study	166	Mean age: 46.54±9.24	1. Periodontal examination (conducted by a single periodontist) 2. Questionnaire (administered by a single researcher)	PD: • Intra-examiner agreement - 0.86 CAL: • Intra-examiner agreement - 0.89	30 patients with Stage I periodontitis 50 patients with Stage II periodontitis 53 patients with Stage III periodontitis 33 patients with Stage IV periodontitis or 32 patients with Grade A periodontitis 70 patients with Grade B periodontitis 64 patients with Grade C periodontitis	PD, CAL, and gingival recession (GR)[xii] assessed using a periodontal probe (Hu-Friedy Williams probe); DMFT also recorded	Age, gender, education level, monthly income, frequency of dental visits, brushing frequency, smoking status, presence of systemic disease	Turkish version of OHIP-14	• Total OHIP-14 scores increased significantly across stages of periodontitis, from Stage I (1.73±2.42) to Stage IV (18.33±8.06) (p<0.001). • Grade C periodontitis cases showed significantly higher OHIP-14 scores (17.39±10.47) compared to Grade A (4.69±5.28) (p<0.001). • OHIP-14 scores were significantly associated with symptoms such as bleeding gums, sore and swollen gums, bad breath, loose teeth, and drifting teeth. • Patients presenting with drifting and loose teeth reported higher mean OHIP-14 scores.	• Among all domains, physical pain had the highest score, particularly in Stage III periodontitis (4.91±1.80). • Higher subscale scores for functional limitation, physical disability, and handicap were recorded in Stage IV.	• Increasing age, low income, and seeking dental care only when symptomatic were associated with Stage III-IV periodontitis, increasing risk by 1.07, 48.61, and 3.03 times respectively. • Both the DMFT index and number of missing teeth were significantly correlated with the total OHIP-14 score and all its subscales.	• Limitations of the DMFT index • Convenience sampling from a periodontology department • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases
Periodontitis, Halitosis and Oral Health-Related Quality of Life – A Cross Sectional Study	Journal of Clinical Medicine	Izidoro et al., 2021, Portugal	A cross-sectional study	72	Age range: 18–65 Mean age: 54.5±17.6	1. Periodontal examination (conducted by a single examiner) 2. Questionnaire (self-administered without interference)	Calibration with five non-study patients. PD: • Intra-examiner agreement - 0.94 • Inter-examiner agreement - 0.97 CAL: • Intra-examiner agreement - 0.94 • Inter-examiner agreement - 0.97	6 patients with Stage I or II periodontitis 31 patients with Stage III periodontitis 35 patients with Stage IV periodontitis	PD, CAL, PI, GR, PD, and BoP measured using a periodontal probe (Hu-Friedy CP-12 probe); Periodontal Epithelial Surface Area (PESA)[xiii] and Periodontal Inflamed Surface Area (PISA)[xiv] calculated; FI evaluated using a Naber probe	Age, gender, education level, occupational status, marital status, smoking habits, alcohol consumption, average monthly family income, systemic disease, medication use, oral hygiene habits	Portuguese version of OHIP-14	• OHIP -14 results were not analyzed according to periodontal outcomes.	• Physical disability was the only subdomain found to be a statistically significant variable across all periodontitis patients (p=0.048).	• No significant differences in OHIP-14 scores were found in relation to halitosis.	• Convenience sampling from a periodontology department • Narrow inclusion criteria (focused on halitosis) • Uneven distribution of subjects across groups • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases
Periodontitis stage and grade are associated with poor oral-health-related quality of life: Findings from the Porto Alegre cohort study	Journal of Clinical Periodontology	Goergen et al., 2021, Brazil	Cohort study	599	Age range: 14–103 Mean age: 37.9±13.3	1. Questionnaire (administered by three dental assistants) 2. Periodontal examination (conducted by three dentists)	Calibration was performed on 57 participants at baseline and 45 participants at follow-up. Mean CAL: • ICC - 0.97 CAL: • Intra-examiner agreement - 0.86 and 0.87 • Inter-examiner agreement - 0.64 and 0.71	80 patients with no periodontitis 115 patients with Stage I periodontitis 163 patients with Stage II periodontitis 241 patients with Stage III or IV periodontitis	PD, CAL, and GR assessed using a periodontal probe (PCP10-SE, Hu-Friedy); DMFT also recorded	Age, gender, skin color, marital status, education level, socioeconomic status, access to dental care, interproximal cleaning habits, smoking, obesity, diabetes, cardiovascular disease, body mass index	Portuguese version of OHIP-14	• Advanced periodontitis stages (particularly Stage III and IV) and higher grades (especially Grade C) were associated with poorer OHRQoL, as reflected by elevated OHIP-14 scores. • Patients with Stage III/IV periodontitis had OHIP-14 scores 1.62 times higher than those without periodontitis (p=0.001). • Grade C periodontitis was associated with a 1.42 times higher OHIP-14 score than Grade B (p<0.001). • At follow-up, patients with Stage III/IV periodontitis had 2.03 times higher prevalence of functional oral and visual outcomes (FOVO)[xix] compared to those with no periodontitis or Stage I. • Patients with Stage III/IV and Grade C periodontitis had 2.07 times higher prevalence of FOVO.	• In terms of FOVO, patients with Stage III/IV and Grade C periodontitis showed significantly higher scores: physical pain increased by 2.45 times, psychological discomfort by 1.95 times, physical disability by 2.89 times, and psychological disability by 5.14 times.	• There was a strong association between the presence of diabetes or cardiovascular disease and poorer OHRQoL.	• CAL calculation method (sum of GR and PD instead of direct measurement) • Low participation rate at five-year follow-up (47.6%); non-respondents were younger and more likely female • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases
Frequency and Risk Indicators of Periodontal Diseases in a Sample of Adult Egyptian Patients: A Hospital-Based Cross-Sectional Study	Archives of Orofacial Sciences	Gamil et al., 2021, Egypt	A cross-sectional study	750	Age range: 16–78 Mean age: 38.6±9.4	1. Questionnaire (administered by the examiner) 2. Periodontal examination (conducted by the same examiner)	Calibration was conducted with five patients prior to the study. Intra-examiner agreement - 0.82	297 patients with gingivitis 285 patients with Stage I periodontitis 153 patients with Stage II periodontitis 12 patients with Stage III periodontitis 3 patients with Stage IV periodontitis	PI, BoP, PD, CAL, and GR assessed using a William's graduated periodontal probe (Martin™, KLS Martin Group, Germany)	Age, gender, place of residence, education level, medical history, frequency of tooth cleaning, smoking, alcohol consumption	Arabic version of OHIP-14	• The highest score was reported in patients with Stage II periodontitis (15.5±9.5), while the lowest was observed in those with Stage III periodontitis (6.8±10.4). • A significant correlation was found between CAL, GR, PI, and OHIP-14 scores (p<0.001).	• No specific results regarding domains were highlighted.	• Lower education levels were linked to more severe stages of periodontitis (p<0.001). • Higher prevalence of hypertension and diabetes was observed in individuals with Stage II periodontitis or worse (p<0.001 and p=0.022, respectively). • Smoking and alcohol consumption were strongly associated with increased periodontitis severity (p<0.001). • Lack of oral hygiene habits was a strong predictor of severe periodontal disease (p<0.001).	• Hospital-based sampling • Use of a non-condition-specific OHRQoL questionnaire for periodontal diseases • Uneven group distribution
The association between stage-grade of periodontitis and sleep quality and oral health–related quality of life	Journal of Periodontology	Karaaslan et al., 2019, Türkiye	A cross-sectional study	99	Age range: 18–40 Mean age: 30.27±5.80	1. Periodontal examination (conducted by a single clinician) 2. Questionnaire (administered)	Calibration was performed with 10 non-study periodontitis patients. PD: • Intra-examiner agreement - 0.80 CAL: • Intra-examiner agreement - 0.68	35 patients with Stage I periodontitis 24 patients with Stage II periodontitis 20 patients with Stage III periodontitis 20 patients with Stage IV periodontitis or 35 patients with Grade A periodontitis 35 patients with Grade B periodontitis 29 patients with Grade C periodontitis	PD and CAL measured (probe type not specified)	Age, gender	Turkish version of OHIP-14 and the Pittsburgh Sleep Quality Index (PSQI)[xv]	• Global OHIP-14 scores increased significantly with periodontitis severity; Mean score of 6.11 in Stage I vs. 21.65 in Stage IV (p<0.001). • Grade C patients had a mean score of 20.28, significantly higher than those with Grade A or B (p<0.001).	• A strong correlation was observed between periodontitis stage/grade and all OHIP-14 subdomains. • Psychological discomfort had the highest scores across all subdomains in Stages II, III, IV and Grades B and C.	• PSQI scores and all related domains showed a strong relationship between poor sleep quality and advanced periodontitis. • A statistically significant relationship was observed between inadequate sleep quality and increased periodontitis severity.	• Relatively small sample size and limited age range (18–40 years) • Exclusion of certain populations with conditions that may affect periodontal status, such as smokers, individuals with diabetes, etc. • Other clinical parameters necessary for diagnosing periodontitis were not assessed • Periodontal parameters used for grading were insufficient

i: Pocket depth; ii: Clinical attachment loss; iii: Intraclass correlation coefficient; iv: Quality of life; v: Plaque index; vi: Gingival Index; vii: Bleeding on probing; viii: Oral health impact profile; ix: Short Form-36 Health Survey; x: Furcation Involvement; xi: Decay, Missing, and Filled Teeth Index; xii: Gingival recession; xiii: Periodontal epithelial surface area; xiv: Periodontal inflamed surface area; xv: Pittsburgh Sleep Quality Index; xvi: Oral Health Related Quality of Life; xvii: Body Mass Index; xviii: Odds ratio; xix: Fairly often and very often; *: Details about data collection are described in a previous study.