

Prevalence of the periodontal status in Germany: results of the 6th German Oral Health Study (DMS • 6). Online Appendix

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ABSTRACT

Objectives: The 6th German Oral Health Study (DMS • 6) reports on the periodontal status in population-based cohorts of younger adults (35- to 44-year-olds) and younger seniors (65- to 74-year-olds).

Method and materials: Participants answered questionnaires regarding oral health behavior, and general and oral health status. Probing depth (PD), clinical attachment level (CAL), and bleeding on probing (BOP) were measured on all teeth except third molars. Number of teeth, BOP, mean PD, mean CAL, the stages of the 2018 classification of periodontal diseases, the prevalence of Community Periodontal Index (CPI), and the Centers for Disease Control and Prevention (CDC)/ American Academy of Periodontology (AAP) case definition were reported.

Results: In total, 9.2%/20.6% of younger adults/younger seniors had a low education status, 25.6%/14.1% of younger adults/younger seniors were current smokers, and 2.1%/15.4% of younger adults/younger seniors had type 2 diabetes. Of all younger adults/younger seniors, 24.4%/38.7% stated that they performed interdental cleaning at least daily. The mean number of teeth in dentate younger adults/younger seniors was 26.6/20.4, of which 5.6/8.3 teeth had PD \geq 4 mm and only 0.6/1.7 teeth had PD \geq 6 mm. The mean number of teeth with CAL \geq 5 mm was 1.1/3.6 in younger adults/younger seniors. Mean PD in younger adults/younger seniors was 2.1 mm/ 2.6 mm; correspondingly, mean CAL was 1.1 mm/2.4 mm. A CPI score of 4 occurred in 16.2%/42.4% of younger adults/younger seniors. In total, 13.6%/26.3% of younger adults/younger seniors were classified as having stage III periodontitis, while 3.9% and 26.4% were classified as having stage IV periodontitis according to the 2018 case classification, respectively.

Conclusion: The periodontitis prevalence according to the 2018 classification (including all stages) was very high at 95.1%/85.2% in younger adults/younger seniors. In total, 31.6%/8.3% of younger adults/younger seniors were classified as stage I (ie, interdental CAL 1 to 2 mm), which, from a clinical point of view, appears to be a transitional phase between gingivitis and periodontitis, which can probably be managed with preventive rather than therapeutic measures. In younger adults and younger seniors, the prevalence of periodontitis in Germany is high, with severe periodontitis (stages III and IV) in 17.5%/52.7% of younger adults/younger seniors.

KEYWORDS: classification, dental care, dentists, DMS 6, epidemiology, prevalence, periodontitis

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Appendix 1

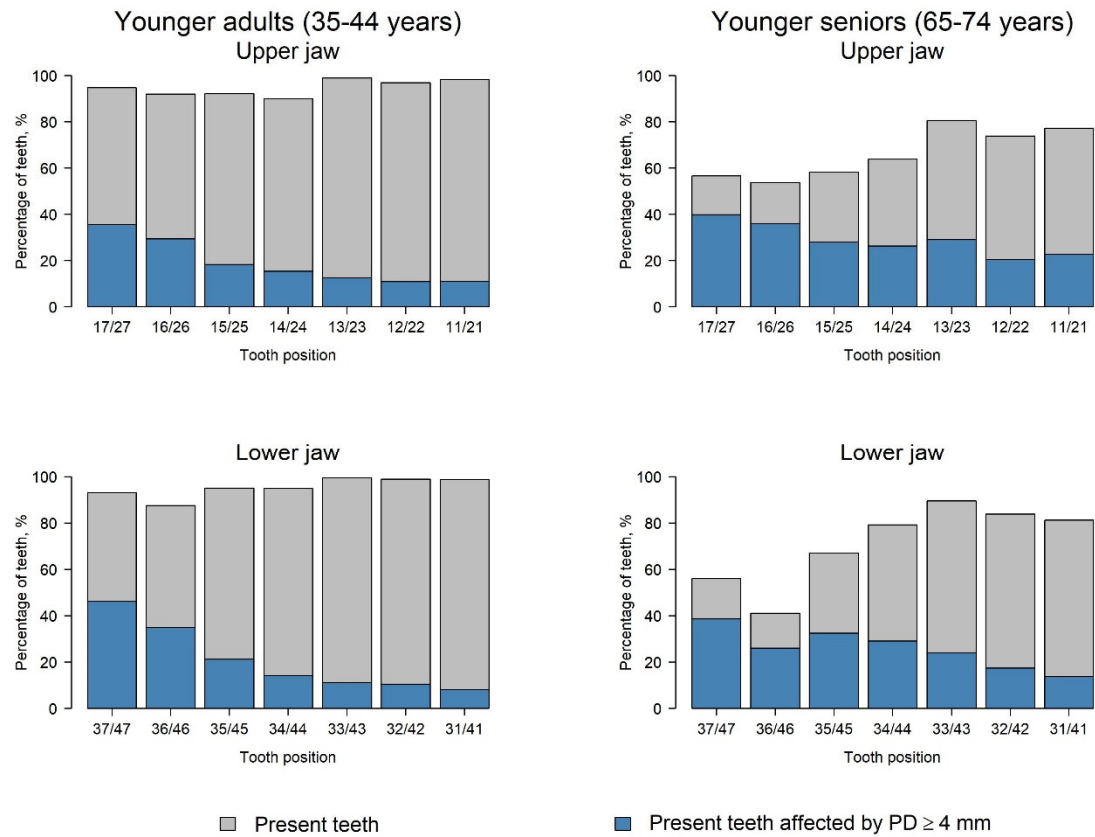


Figure A1. Percentage of present teeth (grey) and present teeth with probing depths ≥ 4 mm (blue) at each tooth position in the upper and lower jaws for younger adults (35- to 44-year-olds) and younger seniors (65- to 74-year-olds)

Appendix 2

Table A2: Categorization according to the 2018 EFP/AAP periodontitis classification in younger adults (35- to 44-year-olds) and younger seniors (65- to 74-year-olds) by periodontal risk factors

| | | | | Periodontitis cases | | | | | |
|---|-------------------------------------|--------------------|------------|---------------------|----------|-----------|----------|------------|----------------|
| | | Periodontal health | Gingivitis | Stage I | Stage II | Stage III | Stage IV | Edentulous | Non-classified |
| 35-44-year-olds (n = 912) | | | | | | | | | |
| By education group | Low | 1.0% | 0.0% | 15.6% | 44.2% | 27.2% | 9.8% | 0.7% | 1.5% |
| | Medium | 3.1% | 0.7% | 30.2% | 50.3% | 11.8% | 3.1% | 0.0% | 0.8% |
| | High | 5.2% | 0.6% | 38.7% | 41.5% | 11.7% | 2.3% | 0.0% | 0.0% |
| By smoking status | Never smoked | 4.8% | 0.8% | 36.3% | 45.8% | 10.4% | 1.9% | 0.0% | 0.0% |
| | Former smoker | 3.8% | 0.4% | 33.7% | 46.9% | 12.1% | 3.1% | 0.0% | 0.0% |
| | Current smoker | 1.7% | 0.0% | 19.4% | 46.1% | 21.6% | 9.0% | 0.2% | 1.9% |
| By body mass index, kg/m ² | ≤ 25 | 5.8% | 0.0% | 37.0% | 44.4% | 10.4% | 1.6% | 0.0% | 0.8% |
| | > 25 | 2.1% | 1.1% | 27.7% | 47.7% | 16.1% | 4.9% | 0.1% | 0.3% |
| By diabetes mellitus | No diabetes or gestational diabetes | 3.9% | 0.6% | 32.2% | 45.9% | 13.3% | 3.6% | 0.1% | 0.5% |
| | Type 1 or type 2 diabetes | 0.0% | 0.0% | 12.3% | 49.6% | 25.7% | 12.3% | 0.0% | 0.0% |
| By Use of electric toothbrushes | ≥ once daily | 4.5% | 0.5% | 33.9% | 44.9% | 15.0% | 1.1% | 0.0% | 0.0% |
| | < once daily | 3.1% | 0.7% | 28.8% | 47.4% | 11.8% | 7.1% | 0.1% | 1.0% |
| By Use of interdental cleaning aids | ≥ once daily | 3.8% | 0.0% | 39.5% | 43.2% | 10.6% | 1.6% | 0.0% | 1.4% |
| | < once daily | 3.9% | 0.7% | 28.9% | 47.0% | 14.5% | 4.7% | 0.1% | 0.2% |
| By utilization of professional tooth cleaning | Yes | 4.7% | 0.7% | 33.3% | 45.6% | 12.4% | 3.2% | 0.0% | 0.0% |
| | No or don't know | 1.0% | 0.0% | 25.6% | 50.6% | 13.5% | 6.8% | 0.3% | 2.2% |
| By lifetime periodontal treatment | Yes | 0.7% | 0.0% | 13.5% | 49.3% | 27.9% | 8.6% | 0.0% | 0.0% |
| | No or don't know | 4.3% | 0.6% | 33.9% | 46.4% | 10.8% | 3.4% | 0.1% | 0.5% |

| 65-74-year-olds (n = 755) | | | | | | | | | |
|---|-------------------------------------|------|------|-------|-------|-------|-------|-------|-------|
| By education group | Low | 0.0% | 0.0% | 5.6% | 15.1% | 27.2% | 29.3% | 9.4% | 13.4% |
| | Medium | 0.0% | 0.0% | 9.3% | 26.7% | 21.0% | 28.7% | 5.3% | 9.0% |
| | High | 0.0% | 0.0% | 8.8% | 28.7% | 34.2% | 22.3% | 2.0% | 4.1% |
| By smoking status | Never smoked | 0.0% | 0.0% | 10.2% | 28.7% | 26.3% | 27.2% | 1.9% | 5.7% |
| | Former smoker | 0.0% | 0.0% | 8.0% | 22.5% | 29.0% | 23.9% | 6.7% | 9.8% |
| | Current smoker | 0.0% | 0.0% | 3.5% | 14.4% | 16.9% | 31.7% | 12.8% | 20.7% |
| By body mass index, kg/m ² | ≤ 25 | 0.0% | 0.0% | 13.3% | 26.3% | 27.6% | 21.5% | 3.2% | 8.1% |
| | > 25 | 0.0% | 0.0% | 5.7% | 23.6% | 25.7% | 29.7% | 6.1% | 9.1% |
| By diabetes mellitus | No diabetes or gestational diabetes | 0.0% | 0.0% | 9.0% | 26.3% | 25.8% | 24.2% | 4.9% | 9.8% |
| | Type 1 or type 2 diabetes | 0.0% | 0.0% | 5.2% | 13.9% | 26.5% | 38.8% | 7.8% | 7.8% |
| By Use of electric toothbrushes | ≥ once daily | 0.0% | 0.0% | 9.1% | 31.3% | 31.2% | 23.2% | 0.3% | 4.9% |
| | < once daily | 0.0% | 0.0% | 8.5% | 21.2% | 24.9% | 32.4% | 0.1% | 12.9% |
| By Use of interdental cleaning aids | ≥ once daily | 0.0% | 0.0% | 11.1% | 30.1% | 29.8% | 23.5% | 0.4% | 5.0% |
| | < once daily | 0.0% | 0.0% | 7.4% | 23.7% | 26.8% | 30.6% | 0.1% | 11.4% |
| By utilization of professional tooth cleaning | Yes | 0.0% | 0.0% | 8.9% | 25.9% | 30.6% | 25.8% | 2.1% | 6.8% |
| | No or don't know | 0.0% | 0.0% | 7.2% | 20.1% | 11.5% | 26.5% | 15.7% | 19.1% |
| By lifetime periodontal treatment | Yes | 0.0% | 0.0% | 5.7% | 13.0% | 28.1% | 34.7% | 6.8% | 11.8% |
| | No or don't know | 0.0% | 0.0% | 9.7% | 29.5% | 25.5% | 22.0% | 4.7% | 8.6% |

Data are presented as weighted percentages for edentate and dentate participants with complete periodontal findings.

EFP/AAP, European Federation of Periodontology/American Academy of Periodontology

Appendix 3

Table A3.1: Dependency of stage prevalence (according to Holtfreter et al. 2024; ACES framework for planned studies) on the availability of severity and complexity factors.

| Factors considered for Staging | Stage | 35-44-years-olds | 65-74-years-olds |
|--|--------------|------------------|------------------|
| <ul style="list-style-type: none"> Maximum interdental CAL Tooth loss due to periodontitis PD \geq 6 mm at \geq 2 non-adjacent teeth Drifting/flaring < 10 opposing pairs of natural teeth | Stage I | 31.6% | 8.3% |
| | Stage II | 46.0% | 24.2% |
| | Stage III | 13.6% | 26.3% |
| | Stage IV | 3.9% | 26.4% |
| <ul style="list-style-type: none"> Maximum interdental CAL PD \geq 6 mm at \geq 2 non-adjacent teeth < 10 opposing pairs of natural teeth (i.e. completed studies) | Stage I | 31.6% | 8.7% |
| | Stage II | 46.3% | 25.9% |
| | Stage III | 14.5% | 27.1% |
| | Stage IV | 2.6% | 23.6% |
| <ul style="list-style-type: none"> Maximum interdental CAL PD \geq 6 mm at \geq 2 non-adjacent teeth | Stage I | 31.6% | 8.7% |
| | Stage II | 46.3% | 25.9% |
| | Stage III/IV | 17.1% | 50.7% |
| <ul style="list-style-type: none"> Maximum interdental CAL | Stage I | 31.6% | 8.7% |
| | Stage II | 46.9% | 27.0% |
| | Stage III/IV | 16.6% | 49.5% |

Table A3.2: Categorization according to the 2018 EFP/AAP periodontitis classification in younger adults (35- to 44-year-olds) and younger seniors (65- to 74-year-olds) by gender

| | | 35- to 44-year-olds | | 65- to 74-year-olds | |
|---------------------|--------------------|------------------------|------------------------|------------------------|------------------------|
| | n | 912 | | 755 | |
| | | Gender | | Gender | |
| | | Male | Female | Male | Female |
| | Periodontal health | 2.9% (1.6; 4.8) | 4.7% (3.1; 6.9) | 0.0% (NA) | 0.0% (NA) |
| | Gingivitis | 1.1% (0.3; 3.2) | 0.0% (NA) | 0.0% (NA) | 0.0% (NA) |
| Periodontitis cases | All stages | 95.8% (82.0; 100.0) | 94.3% (82.0; 100.0) | 85.3% (70.3; 100.0) | 85.1% (70.2; 100.0) |
| | Stage I | 26.9% (23.0; 31.2) | 36.3% (31.9; 40.6) | 5.7% (3.5; 8.3) | 10.7% (7.9; 14.0) |
| | Stage II | 46.1% (41.5; 50.7) | 45.5% (41.1; 50.1) | 17.4% (13.6; 21.4) | 30.5% (26.0; 35.0) |
| | Stage III | 16.9% (13.6; 20.5) | 10.5% (8.0; 13.5) | 30.5% (26.0; 35.6) | 22.4% (18.6; 26.8) |
| | Stage IV | 5.9% (3.9; 8.3) | 2.0% (1.0; 3.5) | 31.8% (27.1; 36.7) | 21.6% (17.7; 25.8) |
| | Edentulous | 0.1% (0.0; 1.0) | 0.0% (NA) | 6.9% (4.7; 9.9) | 3.9% (2.2; 6.0) |
| | Non-classified* | 0.0% (NA) | 0.9% (0.3; 2.0) | 7.8% (5.4; 10.9) | 11.0% (8.1; 14.2) |

Data are presented as unweighted numbers (n) and weighted percentages (with 95% confidence intervals) for edentate and dentate participants with complete periodontal findings.

EFP/AAP, European Federation of Periodontology/American Academy of Periodontology; NA, not available.

*Periodontitis case definition not applicable.

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CITATION

Eickholz, E., Holtfreter, B., Kuhr, K., Dannewitz, B., Jordan, A. J., Kocher, T.: Prevalence of the periodontal status in Germany: results of the 6th German Oral Health Study (DMS • 6). Online Appendix. Zahnmed Forsch Versorg 2025, 5: 10, <http://dx.doi.org/10.23786/2025-5-10>

PUBLICATION DATE

17.03.2025

IMPRESSUM

ZAHNMEDIZIN, FORSCHUNG UND VERSORGUNG

Das Online-Journal des Instituts der Deutschen Zahnärzte (IDZ)



ISSN

0931-9816

PUBLISHER

Institute of German Dentists (Institut der Deutschen Zahnärzte (IDZ)),

Universitätsstraße 73, 50931 Cologne

Funded by

German Dental Association (Bundeszahnärztekammer – Arbeitsgemeinschaft der deutschen Zahnärztekammern e. V. (BZÄK))

and National Association of Statutory Health Insurance Dentists (Kassenzahnärztliche Bundesvereinigung K. d. ö. R.)

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