

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

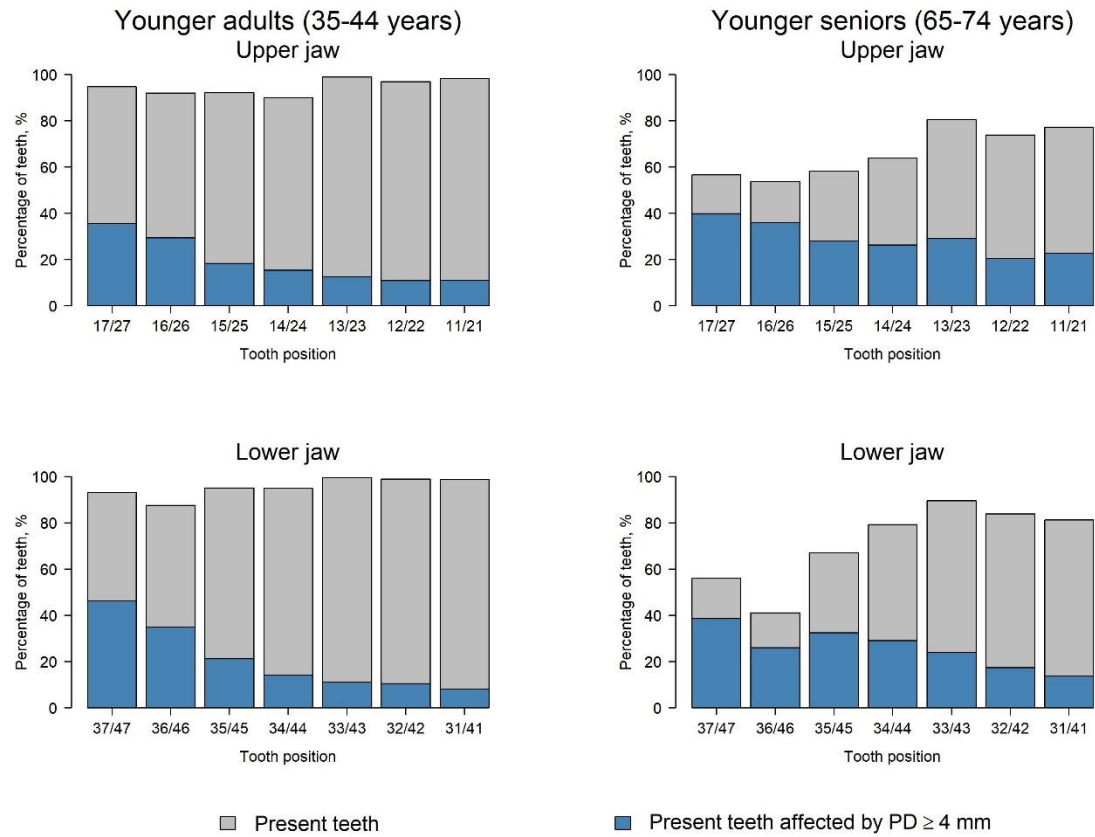


Figure A1. Percentage of present teeth (grey) and present teeth with probing depths ≥ 4 mm (blue) at each tooth position in the upper and lower jaws for younger adults (35- to 44-year-olds) and younger seniors (65- to 74-year-olds)

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

		Periodontal health	Gingivitis	Periodontitis cases				Edentulous	Non-classified
				Stage I	Stage II	Stage III	Stage IV		
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 a available.

*Periodontitis case definition not applicable.

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