

Table 1. Characteristics of athletes

	N	%
Gender	N = 278	
Male	159	57.2
Female	119	42.8
Continent	N = 278	
Africa	78	28.1
America	81	29.1
Europe	59	21.2
Asia	27	9.7
Oceania	33	11.9
Ethnicity	N = 250	
White	85	34.0
Asian	7	2.8
Black	79	31.6
Dual	41	16.4
Other	38	15.2
Sport (top 10)	N = 272	
Track and field	95	34.9
Boxing	38	14.0
Hockey	31	11.4
Swimming	21	7.7
Waterpolo	11	4.0
Judo	10	3.7
Volleyball	8	2.9
Shooting	7	2.6
Football	6	2.2
Weightlifting	6	2.2
Fencing, archery, handball, beach volleyball, taekwondo, wrestling, cycling, basketball, canoeing, gymnastics, equestrian, sailing, table tennis, rowing, badminton	39	14.3
Last visit of dental check-up or dental hygiene	N = 275	
Never	24	8.7
Less than 12 months ago	123	44.7
More than 12 months ago	128	46.5
Mouthguard use in sport	N = 269	
No	186	69.4
Yes	82	30.6
If using mouthguard in sport	N = 83	
Boil and bite	35	42.2
Custom made	48	57.8
Tobacco use	N = 272	
Current	13	4.8
Former	20	7.4

Never	86	87.9
If using tobacco:	N = 25	
Smoking	19	76
Chewing tobacco	5	20
Smokeless	1	4.0

Table 2. Number of teeth and number of athletes with caries

Teeth present	Mean (SD)	Range
Overall N = 246	29.7(2.21)	(22-32)
Caries	N	%
Enamel caries	118/261	45.2
Dentine caries	106/259	40.9
All caries (enamel and/or dentine)	145/263	55.1
Number of athletes with enamel and/or dentine caries by continent	N = 263	
Africa	46	31.7
America	39	26.9
Asia	16	11.0
Europe	29	20.0
Oceania	15	10.3
Number of athletes with enamel and/or dentine caries by continent by ethnicity	N = 240	
White	33	25.8
Asian	5	3.9
Black	45	35.2
Dual	21	16.4
Other	24	18.8
Number of athletes with restorations	N = 263	
Restorations present	170	64.6

Table 3. Number of teeth affected by caries per athlete

	Mean	SD	Range
Overall			
Enamel caries N = 246	1.07	1.83	0-14
Dentine caries N = 246	1.04	1.86	0-11
All caries (enamel and/or dentine) N=263	2.06	3.26	0-24
Restorations N = 246	3.44	4.23	0-24
Teeth with enamel or dentine caries by continent			
Africa	2.73	3.52	0-15
America	1.55	2.18	0-12
Asia	3.13	3.51	0-10
Europe	2.07	4.36	0-24
Oceania	0.87	1.11	0-4
Teeth with enamel or dentine caries by ethnicity			
White	1.62	3.13	0-19
Asian	2.43	2.88	0-7
Black	2.65	4.04	0-24
Dual	2.09	3.30	0-15
Other	1.82	2.33	0-8
Teeth with restorations by continent			
Africa N = 68	1.53	2.42	0-10
America N = 71	3.83	4.70	0-24
Asia N = 23	5.74	4.55	0-14
Europe N = 56	4.55	4.85	0-17
Oceania N = 28	3.00	2.99	0-13
Teeth with restorations by ethnicity			
White N = 77	5.00	4.97	0-24
Asian N = 7	3.00	5.07	0-14
Black N = 67	1.90	2.83	0-12
Dual N = 39	3.31	4.49	0-14
Other N = 34	3.71	3.67	0-11

Table 4. Dental erosion: Frequency of athletes per category (Basic erosive wear examination: BEWE. 9 = unclassifiable due to complete tooth coverage with restoration)

	N	%
Dental erosion anterior and/or posterior teeth	116/260	44.6
Dental erosion anterior teeth	98/273	35.9
Dental erosion posterior teeth	83/260	31.9
Grade of Erosion BEWE		
Anterior teeth		
0	62	40.8
1	53	34.9
2	27	17.8
3	5	3.3
9	5	3.3
Posterior teeth		
0	48	37.5
1	39	30.5
2	26	20.3
3	10	7.8
9	5	3.9

Table 5. Dental and orofacial trauma

	Number of athletes	%
History of previous orofacial trauma		
Yes	79/261	30.3
If previous trauma, type		
Soft tissue only	21/83	25.3
Hard tissue only	36/83	43.4
Athletes with new trauma		
Mouthguard worn	16/76	21.1
Location of new trauma		
Facial/lips	11	45.8
Oral mucosa	1	4.2
Enamel	4	16.6
Enamel+dentine	4	16.6
Enamel+dentine+pulp	2	8.3
Intrusion	1	4.2
Avulsion	1	4.2

Table 6. Periodontal health: Frequency of athletes with worst Basic Periodontal Examination (BPE) score

BPE	N	%
0	25	9%
1 or 2	211	75.9%
3 or 4	42	15.1%

Table 7. Periodontal health: Extent of periodontal disease by Basic Periodontal Examination (BPE) score

BPE	Number of sextants per athlete affected					
	1-2 sextants		3-4 sextants		5-6 sextants	
	N	%	N	%	N	%
1 or 2	36	13.1	37	13.5	174	63.3
3 or 4	18	6.5	16	5.8	7	2.5

Table 8. Pericoronitis and oral mucosal health: Frequency of athletes affected

	N	%
Pericoronitis detected	25/253	9.9
Pericoronitis symptoms	10/36	27.8
Unhealthy oral mucosa	29/246	11.8

Table 9. Impact of oral health on quality of life and performance over previous 12 months

	A little-great deal	Not at all
Extent bothered by oral health N = 271	42%	58%
Extent affecting quality of life N = 264	28%	72%
Extent affecting training or performance N = 266	18%	82%

Table 10. Association between frequency of sports drinks and dental erosion

	Daily frequency of sports drink							
	0	<1	1	2	3	4	5-10	>10
Anterior teeth								
No	7	7	11	11	8	7	3	2
Yes	3	15	15	12	10	2	7	13
						Fisher's exact test P=0.036.		
Posterior teeth (N = 110)								
No	1	4	11	10	6	2	6	2
Yes	2	16	9	12	4	2	10	13
						Fisher's exact test P=0.076		
Anterior and/or posterior teeth			(N = 90)					
No	1	4	6	9	4	2	2	1
Yes	2	10	10	13	5	2	8	11
						Fisher's exact test P=0.47		

Table 11. Association between continental location and ethnicity and caries

	Number (%) of athletes with dental caries in enamel or dentine			P Value
	No	Yes	Total	
Africa	30 (25.4%)	46 (31.7%)	76	Chi-square test P= 0.46 N = 263
America	35 (29.7%)	39 (26.9%)	74	
Asia	8 (6.8%)	16 (11.0%)	24	
Europe	28 (23.7%)	29 (20.0%)	57	
Oceania	17 (14.4%)	15 (10.3%)	32	
White	49 (43.8%)	33 (25.8%)	82	Chi-square test P= 0.029 N=240
Asian	2 (1.8%)	5 (3.9%)	7	
Black	28 (25.0%)	45 (35.2%)	73	
Dual	20 (17.9%)	21 (16.4%)	41	
Other	13 (11.6%)	24 (18.8%)	34	
	Number of athletes with erosion of anterior and/or posterior teeth			P Value
	No	Yes	Total	
Africa	12 (36.4%)	27 (25.2%)	39	Chi-square test P=0.60 N = 140
America	7 (21.2%)	33 (30.8%)	40	
Asia	2 (6.1%)	9 (8.4%)	11	
Europe	7 (21.2%)	27 (25.2%)	34	
Oceania	5 (15.2%)	11 (10.3%)	16	
White	7 (23.3%)	31 (34.1%)	38	Chi-square test P= 0.32 N = 121
Asian	2 (6.7%)	2 (2.2%)	4	
Black	10 (33.3%)	27 (29.7%)	37	
Dual	4 (13.3%)	19 (20.9%)	23	
Other	7 (23.3%)	12 (13.2%)	19	

Table 12. Association between continental location and ethnicity on periodontal health (Basic Periodontal Examination (BPE))

	Africa	America	Asia	Europe	Oceania
	Number (%) athletes per category				
Periodontal health (worst BPE)					
0	7 (9.0%)	7 (8.6%)	1 (3.7%)	4 (6.8%)	6 (18.2%)
1 or 2	58 (74.4%)	62 (76.5%)	23 (85.2%)	46 (78.0%)	22 (66.7%)
3 or 4	13 (16.7%)	12 (14.8%)	3 (11.1%)	9 (15.3%)	5 (15.2%)
				Fisher's exact test: P=0.80 N = 278	
	Median (range) BPE per athlete				
	2.0 (0-3)	1.0 (0-3)	1.0 (0-4)	1.0 (0-3)	1.5 (0 -3)
				Kruskal-Wallis test: P=0.05	
	White	Asian	Black	Dual	Other
	Number (%) athletes per category				
Periodontal health (worst BPE)					
0	15 (17.6%)	0 (0.0%)	3(3.8%)	3 (7.3%)	1 (2.6%)
1 or 2	61 (71.8%)	4 (57.1%)	60 (75.9%)	29 (70.7%)	35 (92.1%)
3 or 4	9 (10.6%)	3 (42.9%)	16 (20.3%)	9 (22.0%)	2 (5.3%)
				Chi-square test: P=0.004 N = 250	
	Median (range) BPE per athlete				
	1.0 (0-3)	2.0 (0-4)	1.50 (0-3)	1.0 (0-3)	2.0 (0-3)
			P=0.001		
		P=0.006			
				Overall: Kruskal-Wallis test: P<0.001	

Table 13. Impact of dental caries, number of teeth, dental erosion and periodontal health (Basic Periodontal Examination (BPE)) on athlete-reported outcomes (bothered by and/or effect on quality of life and/or effect on athletic performance or training)

Impact factor	Summary statistics	Athlete-reported outcomes (bothered by, quality of life and/or athletic performance) affected or not affected by the impact factor		P-value
		No effect	Effect	
Dental caries				
Dentine carious lesions per athlete (N = 245)	Median (range)	0 (0 – 8)	1 (0 – 11)	P< 0.001
Presence of enamel and/or dentine caries (N = 249)	Frequency out of those in the outcome group (%)	53/123 (43.1%)	84/126(66.7%)	Chi-square P<0.001
Presence of enamel and/or dentine caries which does or does not;	Frequency out of those in the outcome group (%)			
bother the athletes (N = 258)		70/149 (47.0%)	74/109 (67.9%)	P=0.001
affect quality of life (N = 250)		(91/178 (51.1%)	46/72 (63.9%)	P=0.090
affect training and (N = 252)		103/205 (50.2%)	36/47 (76.6%)	P=0.002
Presence of dentine caries (N = 245)	Frequency out of those in the outcome group (%)	33/122 (27.0%	67/123 (54.5%)	Chi-square P<0.001
Number of teeth				
Teeth present (N = 256)	Median (range)	30.0 (22-32)	30.0 (22-32)	P=0.79
Teeth with restorations (N =249)	Median (range)	1.0 (0-24)	2.0 (0-17)	P=0.178
Dental erosion				
Presence of erosion (anterior and/or posterior)	Frequency out of those in the outcome group (%)	46/60 (76.7%)	58/75 (77.3%)	Chi-square P>0.99
Periodontal health				
Worst BPE score	Frequency out of those in the outcome			

	group (%)			
BPE=0		16/131 (12.2%)	7/131 (5.3%)	Chi-square P=0.122
BPE=1 or 2		97/131 (74.0%)	101/131 (77.1%)	
BPE=3 or 4		18/131 (13.7%)	23/131 (17.6%)	