

XIII. Oral examinations

- 1) Caries
- 2) Periodontal index
- 3) Denture use
- 4) Tongue coat

Caries, periodontal index, and tongue coat were evaluated by a well trained dentist with a dental mirror and WHO CPI probe. Denture use was asked at oral examination on verbal.

1) Caries

All teeth were classified into intact, decayed, filled, missing, or caries observation.

2) Periodontal index

Periodontal indices (CPI score) on 10 index teeth (17/16, 11, 26/27, 36/37, 31, 46/47) were derived according to World Health Organization standard.

code 0 : healthy gingival tissue

code 1 : bleeding on probing

code 2 : presence of calculus or defective restoration margins

code 3 : presence of 4mm - 6mm pocket

code 4 : presence of more than 6mm pocket

(The highest code was given if two or more phenomena were found on same tooth.)

Missing

Others

3) Denture use

Denture use was asked by a dentist on verbal.

No use

sometimes

always

4) Tongue coat

Score of tongue coat was given by its area on the tongue dorsum.

score 0 : none visible

score 1 : less than one-third on the tongue dorsum

score 2 : less than two-third on the tongue dorsum

score 3 : more than two-third on the tongue dorsum

5) Tongue wetness

Score of tongue wetness was determined by putting Elsalibo R on the tongue dorsum for 10 seconds.

6) Bite force

Each subject clenched a pressure sensitive sheet (Dental PrescaleR 50H, GC Co. Ltd.) as hard as they could at the intercuspal position for 3 seconds.

Average bite force were determined by an image analyzer (Occlusizer R FPD703,GC Co. Ltd.).

1) Caries

The numbers of intact, filled, caries observation, decayed, and missing teeth were counted.

Number of intact teeth

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	15.6	5.6	117	14.6	6.1	84	11.6	7.9	122	6.4	6.8	110	3.9	5.2	21	11.6	7.7	454
Female	13.8	5.1	123	12.0	6.1	104	9.7	6.6	104	5.2	5.3	86	2.4	4.6	12	10.3	6.7	429
Total	14.7	5.4	240	13.2	6.2	188	10.7	7.4	226	5.9	6.2	196	3.4	5.0	33	11.0	7.2	883

Number of filled teeth

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	11.9	5.2	117	11.7	5.0	84	10.2	6.1	122	7.7	5.9	110	8.0	5.9	21	10.2	5.9	454
Female	13.7	4.7	123	13.7	5.2	104	13.2	5.6	104	11.7	6.4	86	5.4	4.9	12	12.9	5.6	429
Total	12.8	5.0	240	12.8	5.2	188	11.6	6.1	226	9.5	6.5	196	7.0	5.6	33	11.5	5.9	883

Number of caries observation teeth

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.1	0.4	117	0.1	0.2	84	0.1	0.3	122	0.0	0.0	110	0.0	0.0	21	0.1	0.3	454
Female	0.1	0.3	123	0.0	0.2	104	0.0	0.2	104	0.0	0.0	86	0.0	0.0	12	0.0	0.2	429
Total	0.1	0.4	240	0.1	0.2	188	0.0	0.2	226	0.0	0.0	196	0.0	0.0	33	0.0	0.3	883

Number of decayed teeth

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.3	0.8	117	0.4	1.1	84	0.3	1.9	122	0.5	1.0	110	0.8	2.1	21	0.4	1.3	454
Female	0.1	0.4	123	0.2	0.7	104	0.2	0.4	104	0.5	1.3	86	0.3	0.6	12	0.2	0.7	429
Total	0.2	0.7	240	0.3	0.9	188	0.2	1.4	226	0.5	1.1	196	0.6	1.7	33	0.3	1.1	883

Number of missing teeth

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	4.1	2.8	117	5.1	2.9	84	9.8	8.1	122	17.3	10.1	110	19.3	8.8	21	9.7	8.9	454
Female	4.2	2.0	123	5.8	2.9	104	8.8	6.8	104	14.6	8.6	86	23.9	7.1	12	8.4	7.2	429
Total	4.1	2.4	240	5.5	2.9	188	9.3	7.5	226	16.1	9.5	196	21.0	8.4	33	9.0	8.1	883

Others

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	0.1	0.3	117	0.2	0.5	84	0.1	0.3	122	0.1	0.3	110	0.0	0.2	21	0.1	0.3	454
Female	0.1	0.5	123	0.2	0.6	104	0.2	0.7	104	0.0	0.3	86	0.0	0.0	12	0.1	0.5	429
Total	0.1	0.4	240	0.2	0.6	188	0.1	0.5	226	0.1	0.3	196	0.0	0.2	33	0.1	0.4	883

2) Periodontal status

Periodontal indices (CPI score) on 10 index teeth (17/16, 11, 26/27, 36/37, 31, 46/47) were derived according to World Health Organization standard.

Periodontal index
17/16

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Healthy gingival tissues	Male	14	12.0	4	4.8	9	7.4	2	1.8	0	0.0	29	6.4
	Female	28	22.8	15	14.4	8	7.7	0	0.0	0	0.0	51	11.9
	Total	42	17.5	19	10.1	17	7.5	2	1.0	0	0.0	80	9.1
Bleeding on probing	Male	6	5.1	2	2.4	2	1.6	1	0.9	0	0.0	11	2.4
	Female	13	10.6	5	4.8	1	1.0	1	1.2	0	0.0	20	4.7
	Total	19	7.9	7	3.7	3	1.3	2	1.0	0	0.0	31	3.5
Calculus detected or defective restoration margins	Male	57	48.7	38	45.2	30	24.6	21	19.1	4	19.0	150	33.0
	Female	50	40.7	46	44.2	40	38.5	25	29.1	3	25.0	164	38.2
	Total	107	44.6	84	44.7	70	31.0	46	23.5	7	21.2	314	35.6
Pocket >4mm, <6mm	Male	33	28.2	21	25.0	27	22.1	15	13.6	3	14.3	99	21.8
	Female	18	14.6	18	17.3	19	18.3	14	16.3	0	0.0	69	16.1
	Total	51	21.3	39	20.7	46	20.4	29	14.8	3	9.1	168	19.0
Pocket >6mm	Male	7	6.0	14	16.7	24	19.7	8	7.3	0	0.0	53	11.7
	Female	13	10.6	15	14.4	22	21.2	16	18.6	0	0.0	66	15.4
	Total	20	8.3	29	15.4	46	20.4	24	12.2	0	0.0	119	13.5
Missing	Male	0	0.0	5	6.0	30	24.6	63	57.3	14	66.7	112	24.7
	Female	1	0.8	5	4.8	14	13.5	30	34.9	9	75.0	59	13.8
	Total	1	0.4	10	5.3	44	19.5	93	47.4	23	69.7	171	19.4

Periodontal index
II

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Healthy gingival tissues	Male	17	14.5	12	14.3	15	12.3	6	5.5	0	0.0	50	11.0
	Female	39	31.7	18	17.3	13	12.5	3	3.5	0	0.0	73	17.0
	Total	56	23.3	30	16.0	28	12.4	9	4.6	0	0.0	123	13.9
Bleeding on probing	Male	8	6.8	4	4.8	7	5.7	1	0.9	0	0.0	20	4.4
	Female	17	13.8	12	11.5	11	10.6	5	5.8	0	0.0	45	10.5
	Total	25	10.4	16	8.5	18	8.0	6	3.1	0	0.0	65	7.4
Calculus detected or defective restoration margins	Male	72	61.5	47	56.0	43	35.2	34	30.9	5	23.8	201	44.3
	Female	47	38.2	51	49.0	48	46.2	34	39.5	2	16.7	182	42.4
	Total	119	49.6	98	52.1	91	40.3	68	34.7	7	21.2	383	48.4
Pocket >4mm, <6mm	Male	13	11.1	8	9.5	15	12.3	9	8.2	4	19.0	49	10.8
	Female	10	8.1	9	8.7	12	11.5	8	9.3	1	8.3	40	9.3
	Total	23	9.6	17	9.0	27	11.9	17	8.7	5	15.2	89	10.1
Pocket >6mm	Male	2	1.7	5	6.0	13	10.7	3	2.7	0	0.0	23	5.1
	Female	5	4.1	8	7.7	7	6.7	8	9.3	0	0.0	28	6.5
	Total	7	2.9	13	6.9	20	8.8	11	5.6	0	0.0	51	5.8
Missing	Male	5	4.3	8	9.5	29	23.8	57	51.8	12	57.1	111	24.4
	Female	4	3.3	6	5.8	13	12.5	28	32.6	9	75.0	60	14.0
	Total	9	3.8	14	7.4	42	18.6	85	43.4	21	63.6	171	19.4
Others	Male	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Female	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2
	Total	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1

Periodontal index
26/27

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Healthy gingival tissues	Male	9	7.7	5	6.0	9	7.4	3	2.7	0	0.0	26	5.7
	Female	28	22.8	13	12.5	10	9.6	0	0.0	0	0.0	51	11.9
	Total	37	15.4	18	9.6	19	8.4	3	1.5	0	0.0	77	8.7
Bleeding on probing	Male	4	3.4	4	4.8	4	3.3	1	0.9	0	0.0	13	2.9
	Female	17	13.8	7	6.7	2	1.9	3	3.5	0	0.0	29	6.8
	Total	21	8.8	11	5.9	6	2.7	4	2.0	0	0.0	42	4.8
Calculus detected or defective restoration margins	Male	59	50.4	44	52.4	35	28.7	23	20.9	6	28.6	167	36.8
	Female	43	35.0	44	42.3	35	33.7	17	19.8	2	16.7	141	32.9
	Total	102	42.5	88	46.8	70	31.0	40	20.4	8	24.2	308	34.9
Pocket >4mm, <6mm	Male	37	31.6	14	16.7	16	13.1	11	10.0	3	14.3	81	17.8
	Female	18	14.6	22	21.2	25	24.0	20	23.3	1	8.3	86	20.0
	Total	55	22.9	36	19.1	41	18.1	31	15.8	4	12.1	167	18.9
Pocket >6mm	Male	8	6.8	16	19.0	27	22.1	8	7.3	0	0.0	59	13.0
	Female	15	12.2	13	12.5	16	15.4	14	16.3	0	0.0	58	13.5
	Total	23	9.6	29	15.4	43	19.0	22	11.2	0	0.0	117	13.3
Missing	Male	0	0.0	1	1.2	31	25.4	62	56.4	12	57.1	106	23.3
	Female	2	1.6	5	4.8	16	15.4	32	37.2	9	75.0	64	14.9
	Total	2	0.8	6	3.2	47	20.8	94	48.0	21	63.6	170	19.3
Others	Male	0	0.0	0	0.0	0	0.0	2	1.8	0	0.0	2	0.4
	Female	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Total	0	0.0	0	0.0	0	0.0	2	1.0	0	0.0	2	0.2

Periodontal index
36/37

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Healthy gingival issues	Male	10	8.5	6	7.1	15	12.3	1	0.9	0	0.0	32	7.0
	Female	17	13.8	14	13.5	4	3.8	2	2.3	0	0.0	37	8.6
	Total	27	11.3	20	10.6	19	8.4	3	1.5	0	0.0	69	7.8
Bleeding on probing	Male	11	9.4	1	1.2	2	1.6	1	0.9	1	4.8	16	3.5
	Female	21	17.1	5	4.8	3	2.9	2	2.3	0	0.0	31	7.2
	Total	32	13.3	6	3.2	5	2.2	3	1.5	1	3.0	47	5.3
Calculus detected or defective restoration margins	Male	66	56.4	44	52.4	33	27.0	18	16.4	6	28.6	167	36.8
	Female	50	40.7	47	45.2	39	37.5	26	30.2	1	8.3	163	38.0
	Total	116	48.3	91	48.4	72	31.9	44	22.4	7	21.2	330	37.4
Pocket >4mm, <6mm	Male	17	14.5	19	22.6	21	17.2	16	14.5	1	4.8	74	16.3
	Female	26	21.1	18	17.3	18	17.3	8	9.3	0	0.0	70	16.3
	Total	43	17.9	37	19.7	39	17.3	24	12.2	1	3.0	144	16.3
Pocket >6mm	Male	10	8.5	10	11.9	23	18.9	11	10.0	1	4.8	55	12.1
	Female	7	5.7	10	9.6	14	13.5	11	12.8	1	8.3	43	10.0
	Total	17	7.1	20	10.6	37	16.4	22	11.2	2	6.1	98	11.1
Missing	Male	3	2.6	4	4.8	28	23.0	63	57.3	12	57.1	110	24.2
	Female	2	1.6	10	9.6	26	25.0	37	43.0	10	83.3	85	19.8
	Total	5	2.1	14	7.4	54	23.9	100	51.0	22	66.7	195	22.1

Periodontal index
31

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Healthy gingival tissues	Male	7	6.0	1	1.2	6	4.9	1	0.9	1	4.8	16	3.5
	Female	19	15.4	17	16.3	6	5.8	1	1.2	0	0.0	43	10.0
	Total	26	10.8	18	9.6	12	5.3	2	1.0	1	3.0	59	6.7
Bleeding on probing	Male	2	1.7	0	0.0	2	1.6	1	0.9	0	0.0	5	1.1
	Female	5	4.1	1	1.0	0	0.0	1	1.2	0	0.0	7	1.6
	Total	7	2.9	1	0.5	2	0.9	2	1.0	0	0.0	12	1.4
Calculus detected or defective restoration margins	Male	90	76.9	62	73.8	65	53.3	46	41.8	5	23.8	268	59.0
	Female	78	63.4	66	63.5	74	71.2	42	48.8	3	25.0	263	61.3
	Total	168	70.0	128	68.1	139	61.5	88	44.9	8	24.2	531	60.1
Pocket >4mm, <6mm	Male	12	10.3	11	13.1	18	14.8	13	11.8	3	14.3	57	12.6
	Female	12	9.8	14	13.5	11	10.6	18	20.9	1	8.3	56	13.1
	Total	24	10.0	25	13.3	29	12.8	31	15.8	4	12.1	113	12.8
Pocket >6mm	Male	4	3.4	6	7.1	9	7.4	8	7.3	2	9.5	29	6.4
	Female	8	6.5	5	4.8	4	3.8	7	8.1	1	8.3	25	5.8
	Total	12	5.0	11	5.9	13	5.8	15	7.7	3	9.1	54	6.1
Missing	Male	2	1.7	4	4.8	22	18.0	41	37.3	10	47.6	79	17.4
	Female	1	0.8	1	1.0	9	8.7	17	19.8	7	58.3	35	8.2
	Total	3	1.3	5	2.7	31	13.7	58	29.6	17	51.5	114	12.9

Periodontal index
46/47

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Healthy gingival tissues	Male	2	1.7	7	8.3	7	5.7	0	0.0	0	0.0	16	3.5
	Female	20	16.3	13	12.5	7	6.7	1	1.2	0	0.0	41	9.6
	Total	22	9.2	20	10.6	14	6.2	1	0.5	0	0.0	57	6.5
Bleeding on probing	Male	11	9.4	1	1.2	5	4.1	1	0.9	0	0.0	18	4.0
	Female	16	13.0	6	5.8	3	2.9	2	2.3	0	0.0	27	6.3
	Total	27	11.3	7	3.7	8	3.5	3	1.5	0	0.0	45	5.1
Calculus detected or defective restoration margins	Male	64	54.7	39	46.4	44	36.1	30	27.3	6	28.6	183	40.3
	Female	50	40.7	44	42.3	34	32.7	18	20.9	0	0.0	146	34.0
	Total	114	47.5	83	44.1	78	34.5	48	24.5	6	18.2	329	37.3
Pocket >4mm, <6mm	Male	33	28.2	20	23.8	19	15.6	17	15.5	2	9.5	91	20.0
	Female	25	20.3	24	23.1	23	22.1	18	20.9	0	0.0	90	21.0
	Total	58	24.2	44	23.4	42	18.6	35	17.9	2	6.1	181	20.5
Pocket >6mm	Male	7	6.0	9	10.7	18	14.8	5	4.5	2	9.5	41	9.0
	Female	10	8.1	7	6.7	12	11.5	9	10.5	1	8.3	39	9.1
	Total	17	7.1	16	8.5	30	13.3	14	7.1	3	9.1	80	9.1
Missing	Male	0	0.0	8	9.5	29	23.8	57	51.8	11	52.4	105	23.1
	Female	2	1.6	10	9.6	25	24.0	38	44.2	11	91.7	86	20.0
	Total	2	0.8	18	9.6	54	23.9	95	48.5	22	66.7	191	21.6

3) Denture use
 Denture use was asked by a dentist on verbal.
 No use, sometimes, always

Denture use

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
No-use	Male	114	97.4	76	90.5	77	63.1	26	23.6	2	9.5	295	65.0
	Female	120	97.6	88	84.6	72	69.2	36	41.9	0	0.0	316	73.7
	Total	234	97.5	164	87.2	149	65.9	62	31.6	2	6.1	611	69.2
Sometime	Male	0	0.0	2	2.4	1	0.8	0	0.0	0	0.0	3	0.7
	Female	0	0.0	3	2.9	2	1.9	1	1.2	0	0.0	6	1.4
	Total	0	0.0	5	2.7	3	1.3	1	0.5	0	0.0	9	1.0
Always	Male	3	2.6	6	7.1	43	35.2	84	76.4	19	90.5	155	34.1
	Female	3	2.4	13	12.5	30	28.8	49	57.0	12	100.0	107	24.9
	Total	6	2.5	19	10.1	73	32.3	133	67.9	31	93.9	262	29.7
Others	Male	0	0.0	0	0.0	1	0.8	0	0.0	0	0.0	1	0.2
	Female	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Total	0	0.0	0	0.0	1	0.4	0	0.0	0	0.0	1	0.1

4) Tongue coat

Tongue coat

		40-49yr		50-59yr		60-69yr		70-79yr		80yr-		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Non visible	Male	90	76.9	49	58.3	60	49.2	51	46.4	8	38.1	258	56.8
	Female	109	88.6	81	77.9	77	74.0	55	64.0	9	75.0	331	77.2
	Total	199	82.9	130	69.1	137	60.6	106	54.1	17	51.5	589	66.7
Less than one-third of the tongue dorsum	Male	11	9.4	24	28.6	34	27.9	24	21.8	3	14.3	96	21.1
	Female	11	8.9	15	14.4	19	18.3	17	19.8	2	16.7	64	14.9
	Total	22	9.2	39	20.7	53	23.5	41	20.9	5	15.2	160	18.1
Less than two-thirds of the tongue dorsum	Male	11	9.4	9	10.7	21	17.2	27	24.5	8	38.1	76	16.7
	Female	2	1.6	8	7.7	7	6.7	13	15.1	1	8.3	31	7.2
	Total	13	5.4	17	9.0	28	12.4	40	20.4	9	27.3	107	12.1
More than two-thirds of the tongue dorsum	Male	5	4.3	2	2.4	7	5.7	8	7.3	2	9.5	24	5.3
	Female	1	0.8	0	0.0	1	1.0	1	1.2	0	0.0	3	0.7
	Total	6	2.5	2	1.1	8	3.5	9	4.6	2	6.1	27	3.1

5) Tongue wetness

Toungue wetness (mm)

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	4.9	2.7	117	4.4	2.5	84	4.8	2.6	122	4.9	2.6	110	6.2	3.2	21	4.8	2.7	454
Female	4.6	2.6	123	4.3	2.8	104	4.3	2.8	104	3.8	2.8	86	3.7	2.7	12	4.2	2.7	429
Total	4.7	2.7	240	4.3	2.7	188	4.5	2.7	226	4.4	2.8	196	5.3	3.2	33	4.5	2.7	883

6) Bite force

Bite area (mm²)

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	21.1	8.7	117	21.6	9.1	84	18.4	10.0	121	10.9	8.7	110	7.8	4.9	21	17.4	10.1	453
Female	15.2	7.4	123	15.3	7.9	104	13.3	7.4	104	9.1	5.9	86	4.2	2.4	12	13.2	7.7	429
Total	18.1	8.6	240	18.1	9.0	188	16.0	9.3	225	10.1	7.7	196	6.5	4.5	33	15.4	9.3	882

Maximum bite force (MPa)

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	101.6	14.2	117	101.9	17.3	84	100.3	17.5	121	90.5	25.3	110	97.2	21.9	21	98.4	19.6	453
Female	99.2	15.7	123	99.0	15.9	104	93.9	19.3	104	91.4	22.9	86	86.9	26.1	12	95.9	18.8	429
Total	100.3	15.0	240	100.3	16.5	188	97.3	18.6	225	90.9	24.2	196	93.5	23.6	33	97.2	19.3	882

Average bite force (N)

	40-49yr			50-59yr			60-69yr			70-79yr			80yr-			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	683.4	273.4	117	697.1	287.9	84	594.1	292.9	121	363.2	300.6	110	258.3	168.2	21	564.6	318.7	453
Female	502.0	222.5	123	482.7	237.4	104	424.6	217.5	104	297.4	179.8	86	138.4	91.5	12	427.4	231.9	429
Total	590.4	264.2	240	578.5	281.5	188	515.8	273.7	225	334.3	256.3	196	214.7	154.9	33	497.9	288.0	882