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IV.	20
V.	24
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1.	7
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4.	12
5.	가	13
6.	13
7.	15
8.	17
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4.	11

1.	31
2.	32

489 (101 ,
388)
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, , , 가 2001 5 16 17
.
22
2001 10 24 10 27 .
SAS
t- 2 -

가

51.5%

23.7% . 79.2%

44.3% .

(p=0.0003) 가 (p=0.0001)

5 (p<0.0001). 가

2 (p<0.002). 1.8

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2 가 3-4

2.2 가 .

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1.

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. 1990

85.3%가

(,1995),

가 가

(,1983).

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12

가 1978

2.6 ,

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2.9 ,

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12

3.3

1972

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1.5 ,

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가 .
25% , 31% ,
5-25%
(Vickers,1993), 가 .
18 4.6 가 15.4% ,
3.2 가 15.0% (,1997).
30%
가 80%가
(Dietz,1983; Price,1987). 가

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489

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2001 5 16 , 17

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10 27

2.

가.

(20% -) .
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 t-
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SAS

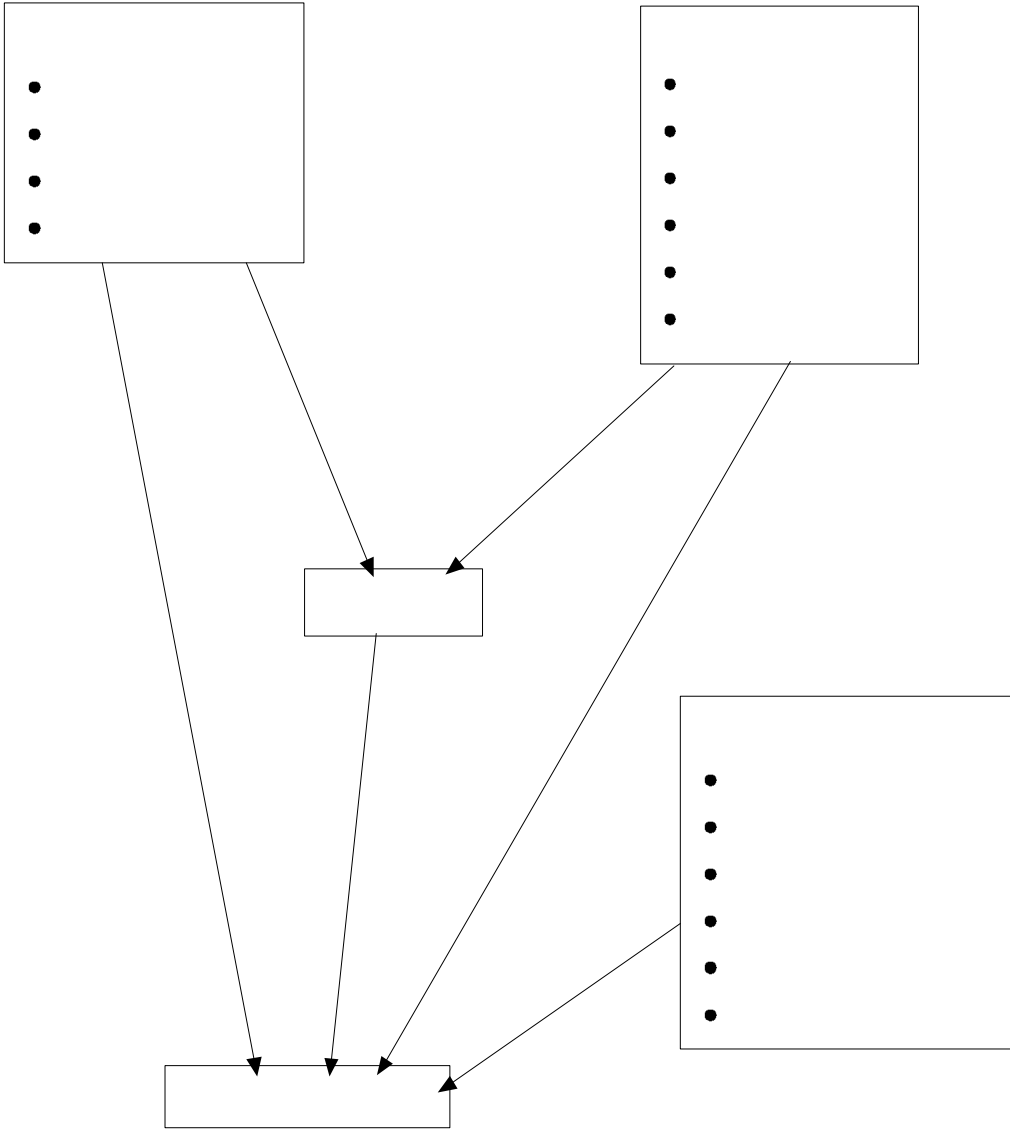
$$(\%) = [(\quad - \quad) / \quad] \times 100$$

가 20% ,

20% - 30% ,

30% - 50%

50% .



1.

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1.

1.

	()	(%)
	8	1.6
	90	18.4
	112	23.0
	99	20.3
	179	36.7
	243	50.4
	239	49.6
	43	8.8
	251	51.4
	194	39.8
	79	16.2
	318	65.0
	92	18.8

36.7% 가

23.0%

49.6%

50.4%

51.4%

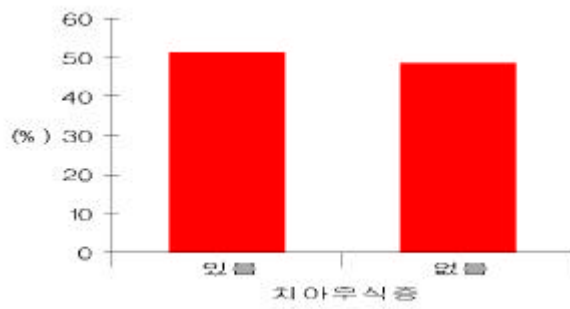
65.0% 가

가

2.

가.

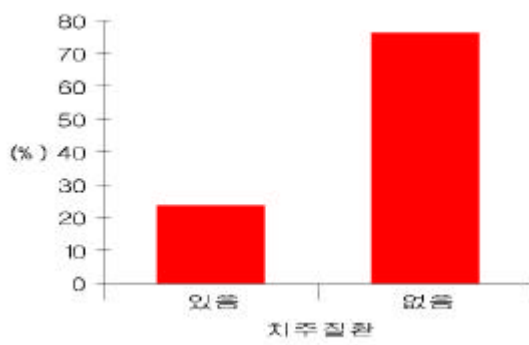
489 252 (51.5%),
237 (48.5%) .



< 2 >

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116 (23.7%), 가 373
(76.3%) .



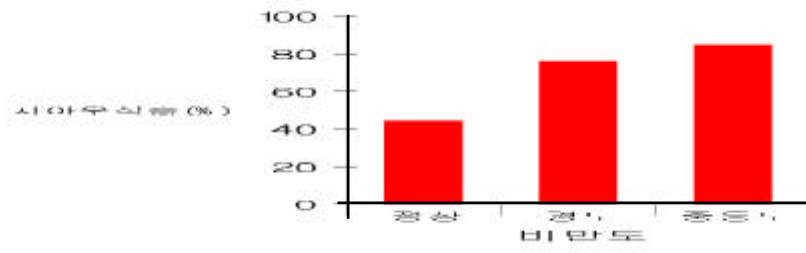
< 3 >

101 80 (79.2%)

388 172 (44.3%)

2.

	()	(%)
	388	44.3
	101	79.2



< 4 >

54.6% 가

38.0% 가

4.

	(%)	(%)	²	p
	1(12.5)	7(87.5)		
	34(37.8)	56(62.2)		
	62(52.4)	50(44.6)	14.01	0.007
	55(55.6)	44(44.4)		
	99(55.3)	80(44.7)		
	21(48.9)	22(51.1)		
	124(49.4)	127(50.6)	1.328	0.514
	106(54.6)	88(45.4)		
	121(49.8)	122(50.2)	0.413	0.52
	127(53.1)	112(46.9)		
	30(38.0)	49(62.0)		
	172(54.1)	146(45.9)	6.937	0.031
	50(54.4)	42(45.6)		

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가

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5. 가

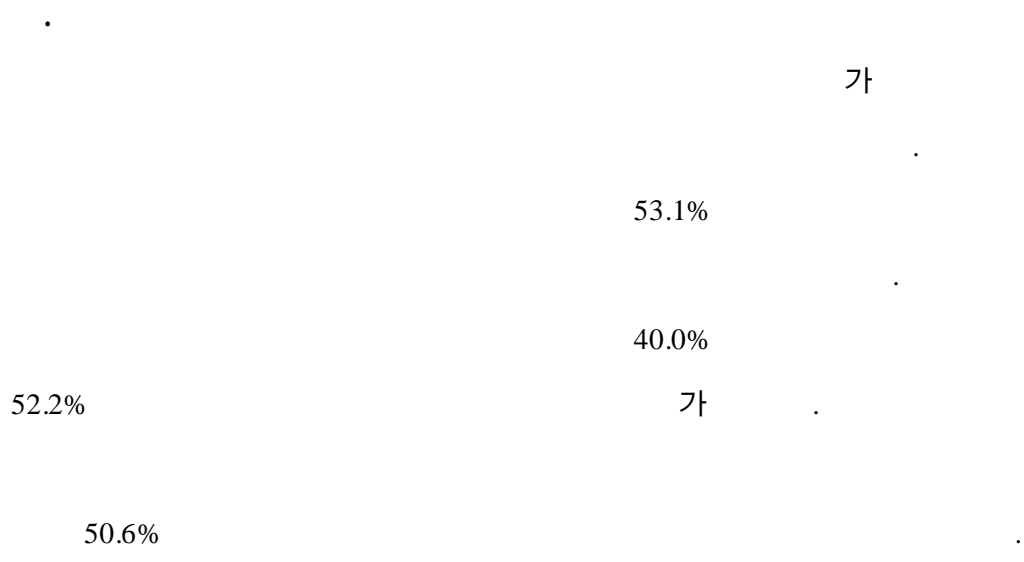
	(%)	(%)	²	p
	150(52.0)	138(48.0)	4.764	0.189
	92(52.8)	82(47.2)		
	2(40.0)	3(60.0)	4.058	0.255
	240(52.9)	214(47.1)		
	11(35.5)	20(64.5)	5.941	0.114
	208(53.8)	179(46.2)		
	53(44.2)	67(55.8)	6.32	0.097
	83(56.1)	65(43.9)		
	18(38.3)	29(61.7)	5.933	0.114
	153(53.3)	134(46.7)		
	5(50.0)	5(50.0)	0.000	1.000
	247(51.6)	232(48.4)		

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가 가
가 .

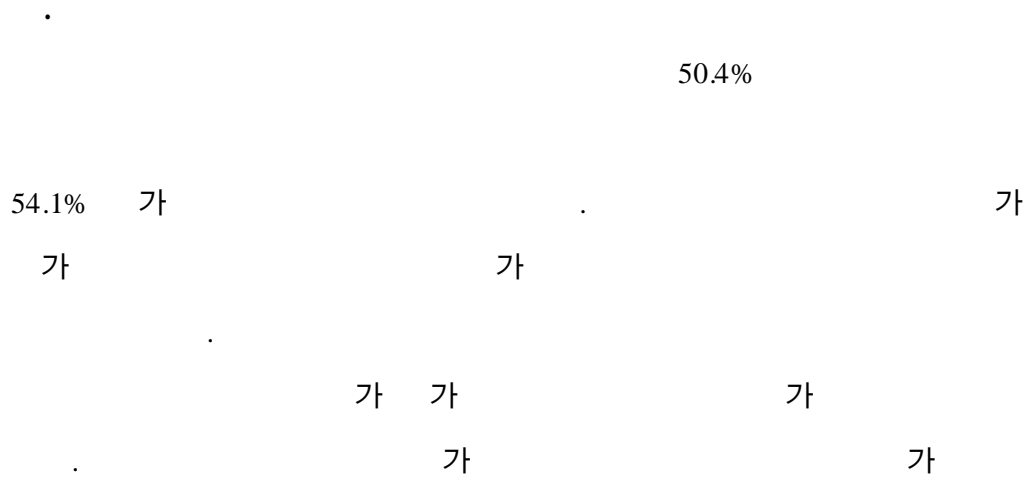
6.

	±	±	t	p
	160.7 ± 5.2	160.8 ± 4.8	0.28	0.781
	57.1 ± 10.3	54.3 ± 6.4	-3.66	0.0003
가	82.2 ± 9.2	77.4 ± 7.4	-6.37	0.0001



7.

	----- (%)		²	p
0	101(47.6)	111(52.4)		
1-2	84(53.5)	73(46.5)	2.417	0.298
3	67(55.8)	53(44.2)		
0	10(43.5)	13(56.5)		
1-2	155(52.2)	142(47.8)	0.656	0.883
3	76(51.3)	72(48.7)		
	35(43.8)	45(56.2)	1.962	0.161
	217(53.1)	192(46.9)		
	170(54.1)	144(45.9)	2.103	0.146
	82(46.9)	93(53.1)		
	10(40.0)	15(60.0)	0.958	0.327
	242(52.2)	222(47.8)		
	49(51.6)	46(48.4)	0.000	1.000
	203(51.5)	191(48.5)		
	18(51.4)	17(48.6)		
	41(50.6)	40(49.4)	0.033	0.983
,	193(51.7)	180(48.3)		



8.

	----- (%)		²	p
	67(50.4)	66(49.6)		
	93(58.1)	67(41.9)		
	35(53.0)	31(47.0)	5.989	0.112
	57(43.9)	73(56.1)		
	22(50.0)	22(50.0)		
	33(54.1)	28(45.9)	0.210	0.900
	197(51.3)	187(48.7)		
10	43(53.1)	38(46.9)		
10-30	185(51.1)	177(48.9)	0.112	0.945
30	24(52.2)	22(47.8)		
0 - 1	62(49.2)	64(50.8)		
2 - 3	133(51.6)	125(48.4)	0.408	0.815
4	55(53.4)	48(46.6)		
0	33(38.3)	53(61.7)		
1 - 2	135(53.8)	116(46.2)		
3 - 4	48(58.5)	34(41.5)	8.084	0.044
5	36(51.4)	34(48.6)		
0	8(50.0)	8(50.0)		
1	76(46.3)	88(53.7)		
2	98(53.0)	87(47.0)	3.139	0.370
3	70(56.5)	54(43.5)		
	67(47.2)	75(52.8)		
	79(49.1)	82(50.9)		
,	92(59.4)	63(40.6)	5.768	0.123
	14(45.2)	17(54.8)		

4.

		가 5	(p=0.0001).
			가 2
			가 1.8
(p=0.029)	1.8		(p=0.072)
	0		가 1-2
	가 2.0	(p=0.009), 3-4	2.2 (p=0.006)

9.

		95%	p (* :)
	1.0		
	4.988	2.930-8.490	0.0001*
	1.0		
	1.991	1.265-3.134	0.0029*
	1.0		
	1.817	1.062-3.106	0.0292*
	1.813	0.947-3.469	0.0725
0	1.0		
1-2	2.033	1.188-3.480	0.0096*
3-4	2.224	1.246-3.970	0.0069*

*P<0.05

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1970

가

(Satu, 1987). 1980

(Thylstrup, 1994).

1977

가

가

1992

1993

6

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2

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(1994)

가 가

가

(ICD-9 codes)

278.0

(, 1996).

가

가

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가

가

1972 63.5%

(, 1973), 1974

87.7% (, 1974).

가

(DHEW, 1967).

가 (, 1997).

51.3%

79.2% . , ,

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Hankin

(1973), Potgieter(1956), Zita(1959), Weiss Trithart(1960)

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. Bargramia Russel(1973)

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(, 1997;
 Stamm, 1988). 가
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 (Bastiaan, 1980) ,
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 . Johansson et al.(1994) 25-64
 가
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 . Wakai et al.(1999)가 630
 CPITN(community periodontal
 index for treatment needs) .

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1983; 7(1): 7- 19

(1979- 1996) 가 18
1997; 30(7) : 832- 39

1994; 18: 119

1997; 21(1): 1- 22

1995; 19: 17- 208

1979; 4(1): 19- 43

1995; 4(1): 19- 43.

1973; 10(1): 29-36

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1992; 13(4) : 344-45

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1997; 21(2): 255-78

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1974; 12(7): 511-19

2000; 24(1): 21-29

(1). 96-9

1990; 23(5): 333

Abernathy JR, Graves RD, Bohannon HM, Stamm JW, Greenberg BG, Disney JA. Development and application of a prediction mode for dental caries. Community Dent Oral Epidemiol 1987; 15: 24-8

Bagramian RA, Russell AL. Epidemiologic Study of dental caries experience and between-meal eating pattern. JDR 1973; 52: 342-47

Bastiaan, RJ, and Reade, P.C. The histopathologic features which follow repeated applications of tobacco tar lip mucosa. Oral Surgery 1980; 49:435-40

Beck JD. Identification of high caries risk adult attitudes social factors and diseases. Inter Dent J 1988; 38: 231-38

Dietz WH. Childhood obesity susceptibility cause and management. J Ped 1983; 103(5): 676-86

Disney JA, Graves RC, Stamm JW, Bohanna HM. The University of North Carolina Caries Risk Assessment Study Baseline Caries Prevalence. J Public Health Dent 1990; 50(3): 178-85

Graves RC, Abernathy RC. University of North Carolina Caries Risk Assessment Study Multiple Factors in Caries Prevalence. J Public Health Dent 1991; 5: 4-17

Hankin JH, Chung CS, Jae MCW. Genetic and epidemiologic studies of oral characteristics in Hawaii's schoolchildren Dietary pattern and caries prevalence. JDR 1973; 52: 1079-86

Isokangas P, Alanen P, Tiesbo J. The clinician's ability to identify caries risk subjects without saliva tests-a pilot study. Community Dent Oral Epidemiol 1993; 21: 8-10

Johansson, I, Tidehag P, Lundberg V, Hallmans G. Dental status, diet and cardiovascular risk factor in middle-age people in northern Sweden Community. Dent Oral Epidemiol 1994; 22(6): 431-36

Potgieter M, Morse EH, Erlenbach FM, Dall R. The food habits and dental status of some Connecticut children. JDR 1956; 35(4): 638-44

Price JH, Desmond SM, Ruppert ES, Stelzer CM. School nurse's perceptions of childhood obesity. J School Health 1987; 57: 332-36

Satu A, Eija K, Marjatta N. Caries in the primary teeth and salivary Streptococcus mutans and Lactobacillus levels as indicators of caries in permanent teeth. Pediatric Dent 1987; 9(2): 126-30

Stamm JW, Disney JA, Graves RC, Bohanna HM. The university of

North Carolina Caries Risk Assessment Study Rationale and Content. J Pub Health Dent 1988; 48(4): 225-32

Thylstrup A, Fejerskov O. Textbook of Clinical Cariology. Copenhagen Denmark Munksgaard Textbook 1994; 333-53

U.S. Department of Health, Education, and Welfare. Decayed, missing, and filled teeth, United States, 1960-1962(National Center for Health Statistics, Public Health Service) 1967; 1000(11): 23

Vickers MJ. Understanding obesity in women. J Obstet Gynecol Neonatal Nurse 1993; 22(1): 17-23

Wakai, Kenji, Takashi, Kawamura, Osami Umemura, Yasushi Hara, Jun-Ichiroh Machida, Takafumi Anno, Yoshio Ichihara, Yoshiko Mizuno, Akiko Tamakoshi, Yingsong Lin, Toshiko Nakayama, and Yoshiyuki Ohno. Associations of medical status and physical fitness with periodontal disease. J Clin Periodontal 1999; 26: 664-72

Weiss RL, Trithart AH. Between-meal eating habits and dental caries experience in preschool children. Ann J Public Health 1960; 50(8): 1097-104

Zita AC, McDonald RE, Andrews AL. Dietary habit and the dental caries experience in 200 children. JDR 1959; 38: 860-65

1.

(cm) \ (Kg)				
110 - 111.9	18.7	22.5 - 24.3	24.4 - 28.0	28.1
112 - 113.9	19.3	23.2 - 25.0	25.1 - 28.9	29.0
114 - 115.9	19.9	23.9 - 25.8	25.9 - 29.8	29.9
116 - 117.9	20.7	24.9 - 26.9	27.0 - 31.0	31.1
118 - 119.9	21.6	26.0 - 28.0	28.1 - 32.3	32.4
120 - 121.9	22.3	26.9 - 28.9	29.0 - 33.4	33.5
122 - 123.9	23.3	28.0 - 30.2	30.3 - 34.9	35.0
124 - 125.9	24.1	29.0 - 31.3	31.4 - 36.1	36.2
126 - 127.9	25.0	30.0 - 31.2	32.5 - 37.4	37.5
128 - 129.9	26.0	31.2 - 33.7	33.8 - 38.9	39.0
130 - 131.9	27.1	32.6 - 35.2	35.3 - 40.6	40.7
132 - 133.9	28.2	33.9 - 36.6	36.7 - 42.2	42.3
134 - 135.9	29.1	35.0 - 37.8	37.9 - 43.6	43.7
136 - 137.9	30.3	36.4 - 39.3	39.4 - 45.4	45.5
138 - 139.9	31.5	37.8 - 40.9	41.0 - 47.2	47.3
140 - 141.9	33.0	39.6 - 42.8	42.9 - 49.4	49.5
142 - 143.9	34.1	41.0 - 44.3	44.4 - 51.1	51.2
144 - 145.9	35.5	42.6 - 46.1	46.2 - 53.2	53.3
146 - 147.9	36.9	44.3 - 47.9	48.0 - 55.3	55.4
148 - 149.9	38.2	45.9 - 49.6	49.7 - 57.2	57.3
150 - 151.9	40.2	48.3 - 52.2	52.3 - 60.2	60.3
152 - 153.9	41.8	50.2 - 54.3	54.4 - 62.6	62.7
154 - 155.9	44.0	52.8 - 57.1	57.2 - 65.9	66.0
156 - 157.9	45.8	55.0 - 59.5	59.6 - 68.6	68.7
158 - 159.9	48.2	57.9 - 62.6	62.7 - 72.2	72.3
160 - 161.9	50.1	60.2 - 65.1	65.2 - 75.1	75.2
162 - 163.9	52.8	63.4 - 68.6	68.7 - 79.1	79.2
164 - 165.9	54.8	65.9 - 71.3	71.4 - 82.3	82.4
166 - 167.9	56.8	68.2 - 73.8	73.9 - 85.1	85.2
168 - 169.9	57.8	69.4 - 75.1	75.2 - 86.6	86.7
170 - 171.9	59.5	71.4 - 77.3	77.4 - 89.2	89.3
172 - 173.9	60.8	73.0 - 79.0	79.1 - 91.1	91.2
174 - 175.9	62.4	74.9 - 81.1	81.2 - 93.5	93.6
176 - 177.9	63.9	76.7 - 83.0	83.1 - 95.8	95.9
178 - 179.9	65.7	78.9 - 85.4	85.5 - 98.5	98.6

(cm) \ (Kg)				
110 - 111.9	18.3	22.0 - 23.7	23.8 - 27.4	27.5
112 - 113.9	18.9	22.7 - 24.5	24.6 - 28.3	28.4
114 - 115.9	19.5	23.4 - 25.3	25.4 - 29.2	29.3
116 - 117.9	20.2	24.3 - 26.2	26.3 - 30.2	30.3
118 - 119.9	20.9	25.1 - 27.1	27.2 - 31.3	31.4
120 - 121.9	21.8	26.2 - 28.3	28.4 - 32.6	32.7
122 - 123.9	22.9	27.5 - 29.7	29.8 - 34.3	34.4
124 - 125.9	23.6	28.4 - 30.6	30.7 - 35.3	35.4
126 - 127.9	24.6	29.6 - 31.9	32.0 - 36.8	36.9
128 - 129.9	25.5	30.6 - 33.1	33.2 - 38.2	38.3
130 - 131.9	26.7	32.1 - 34.7	34.8 - 40.0	40.1
132 - 133.9	27.7	33.3 - 36.0	36.1 - 41.5	41.6
134 - 135.9	28.7	34.5 - 37.3	37.4 - 43.0	43.1
136 - 137.9	30.0	36.0 - 38.9	39.0 - 44.9	45.0
138 - 139.9	31.0	37.2 - 40.2	40.3 - 46.4	46.5
140 - 141.9	33.0	39.6 - 42.8	42.9 - 49.4	49.5
142 - 143.9	34.7	41.7 - 45.1	45.2 - 52.0	52.1
144 - 145.9	37.1	44.6 - 48.2	48.3 - 55.6	55.7
146 - 147.9	39.8	47.8 - 51.7	51.8 - 59.6	59.7
148 - 149.9	42.6	51.2 - 55.3	55.4 - 63.8	63.9
150 - 151.9	45.0	54.0 - 58.4	58.5 - 67.4	67.5
152 - 153.9	46.8	56.2 - 60.8	60.9 - 70.1	70.2
154 - 155.9	48.6	58.4 - 63.1	63.2 - 72.8	72.9
156 - 157.9	49.9	59.9 - 64.8	64.9 - 74.8	74.9
158 - 159.9	51.3	61.6 - 66.6	66.7 - 76.9	77.0
160 - 161.9	52.6	63.2 - 68.3	68.4 - 78.8	78.9
162 - 163.9	53.7	64.5 - 69.8	69.9 - 80.5	80.6
164 - 165.9	54.7	65.7 - 71.1	72.1 - 82.0	82.1
166 - 167.9	55.7	66.9 - 72.4	72.5 - 83.5	83.6
168 - 169.9	56.4	67.7 - 73.3	73.4 - 84.5	84.6
170 - 171.9	57.4	68.9 - 74.6	74.7 - 86.0	86.1

* 180cm , 172cm

$$= (\quad - 100) * 0.9$$

2.

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1. ? ()

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2. ? ()

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5. 가 0

1) :

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(6-7)

7. ?

1. () ?
2. 0 1 2 3 ?
3. 가 ? , 가
4. 0 - 1 2 - 3 () ? 6 - 7 ()
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7. 0 1-2 3-4 ? (5)
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ABSTRACT

A study on the association between obesity and dental caries

Park, jungkun
Graduate School of
Health Science and
Management
Yonsei University

This study was conducted to investigate the relationship between obesity and dental caries. A total number of 489 high school girls (101 obese girls and 388 girls with normal weight) was included. We collected the data of oral examination and physical examination on May 16, 2001 and may 17, 2001 respectively. To get data on general characteristics, oral health behavior and diet habit, we executed survey with questionnaire comprising with 22 questions on October 24, 2001. We collected the questionnaire on October 27. We made the collected material as code and analyzed them with SAS package program. Initially, we assessed the relation between obesity, general characteristics, oral health behavior, diet habit and dental caries by using t-test and chi-square. We estimated the prevalence of dental caries according to obesity. To find the significant factors related to the dental caries t-test and χ^2 -test were used. Finally logistic regression was used to find the relationship between obesity and dental caries after the adjustment for candidate confounders.

Followings are the result of the study;

Prevalence of dental caries and periodontal disease were 51.5% and 23.7%, respectively. Prevalence of dental caries in obese group was 79.2% while normal weighted group was 44.3%. Weight ($p=0.0003$) and

bust ($p=0.0001$) was significantly related to the dental caries in bivariate analysis. The odds ratio of dental caries in individuals with obesity was 5.0(2.9-8.5) after adjustment periodontal disease, and mother's education level and number of snack at night. With periodontal disease higher 2 times increase of dental caries ($p<0.002$) than that of without periodontal disease. If we set the middle school graduates in mother's education level as reference category, high school graduates show 1.8 times increase of dental caries. Times to have snack at night have shown meaningful association with dental caries. The odds compared to 0 time ratio of dental caries in individuals with 1-2times and 3-4 times of night snack intake was 2.0and 2.2(1.2-3.9) respectively after adjustment for periodontal disease, mother's education level and obesity.

In summary, obesity, periodontal disease, mother's education level, snack at night were significantly associated with dental caries in high school girls. Especially obesity is the most significant associated with dental caries. But this association should be further investigated for their causal relationship.