

# ORAL HEALTH AND SELF-RATED HEALTH AMONG 80 YEAR OLD COMMUNITY DWELLING PEOPLE

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## ABSTRACT

*Oral health is an important discipline of health that can affect functioning of health and have severe consequences. The aim of the study was to examine the oral health of the older people and how oral health is associated with self-rated health.*

*The study was a part of Evergreen Project conducted by the University of Jyväskylä. The participants were 80 year-old persons living in the city of Jyväskylä. People who were living in institutions were excluded from the study sample (N= 265, 74 men, 188 women). The study included clinical measures of oral health such as participants need for dental care. The data were analyzed by chi square test, t-test and logistic regression analysis using SPSS version 19.*

*Among men and women, significant differences were found in the number of intact teeth, number of decayed teeth and Decayed Missing Filled Teeth index. There was no association between self-rated health and oral health status (Odds Ratio 2.5, 95% Confidence Interval 0.80-7.5).*

*The results indicated that there were differences in oral health among older people. However, no association was found between self-rated health and oral health. It explains that dental care at old age could affect not only oral health but also can affect individual senses of general health.*

**Key Words:** Self-rated health, older people, oral health, dental care.

## INTRODUCTION

Health is multi-dimensional and is affected by interacting social, behavioral and biomedical processes.<sup>20</sup> Health can be assessed e.g. by a doctor or by a person him or herself. Subjective indicators can be understood as those based on a person's feelings and they can be associated with self-rated health, while objective indicators are based on medically defined criteria concerning diseases.<sup>9</sup> There is significant association between self-rated health and mortality supporting the validity of self-ratings of health.<sup>6</sup> Poor self-rated health is linked with decline in physical activity, chronic diseases and functional limitation.<sup>4-10</sup>

Poor oral health can affect functioning and have severe consequences. Its problems can lead to discomfort, pain, complications in eating, communication, diseases, decline in social activities and low self-esteem.<sup>17-19</sup> Older people with prosthesis may not be able to take all the diets which are fundamental for the body and if it is not maintained properly there might be harmful

consequences.<sup>9</sup> Previous studies have shown that poor oral health status is related to lifestyle that increases the risk for cardio vascular diseases.<sup>8,12</sup> Moreover, edentulous people smoked more frequently than their dentate counterparts in a study among middle- aged people in Sweden.<sup>8</sup> Chronic obstructive pulmonary disease and aspiration pneumonia are associated with poor oral health.<sup>13,2</sup> Previous studies have shown that regular use of high number of medications increases the risk of hyposalivation and oral diseases in general.<sup>12,15</sup> Hence diseases, medications and physical limitations contribute both to poor oral health and also add to poor self-rated health.<sup>3</sup> The principle aim of the present study was to examine oral health of the older people and to study the association between oral health status and self-rated health among older people.

The purpose of the present study was to examine oral health of 80-year-old men and women and how oral health associates with self-rated health. More specifically the aim was to study relationship of self-rated health with oral health status. The research questions are:

- What is the level of oral health of 80 years old men and women?
- What are the factors affecting oral health status and self-rated health?

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- Is oral health status associated with self-rated health?

## METHODOLOGY

### *Study design and participants*

This study was part of Evergreen project, conducted by University of Jyväskylä. The study cohort included community living people in city of Jyväskylä, born in 1910. The inclusion criteria were: community living people and excluded people living in institutions and nursing homes. The study is based on base line data collected in 1990 by interviews, questionnaires and examinations carried out either at study centre or participant homes. The sample consisted of 291 older adults (78 males, 213 females) of whom 283 (76 males, 207 females) were eligible. The eight missing persons were one man and five women who died, and two persons moved away from Jyväskylä before the starting of examination. Of the eligible population 262 (74 males, 188 females) 92.6% took part in the interview and 72.4% in examinations. Furthermore of the eligible population 21 persons refused to participate for unknown reasons.

### *Data acquisition and variables*

Self-rated health was elicited by the question "How would you describe your health?" The scale used was as follow 1= excellent, 2=good, 3=moderate, 4=not so good, 5= poor. For statistical analysis the number of categories was reduced to three: 1-2, 3 and 4-5. Educational level was assessed by asking "What is the level of your education?" Due to small number of answers in extreme categories the answers were categorized into primary school- middle school, high school and university. Participants were asked to rate their socio-economic status into three categories: good, fair and bad. Smoking was elicited by the questions "How many years have you been smoking?" Duration of smoking in years was regrouped into two classes: those who had never smoked and those who had smoked for one year or more. The information on heart disease is included in present study. Heart diseases were regrouped into two classes: those who had one or more heart diseases and those who had no heart diseases.

The dental examinations were performed by the dentist assisted by the nurse. Healthy teeth, decayed teeth, filled teeth and missing teeth were recorded. World Health Organization recommendations were followed for the diagnosis of carious lesions<sup>24</sup> and Decayed Missing Filled Teeth (DMFT) index was calculated and coding was used for recording dentition status. 0= Healthy teeth, 1=carious teeth, 2=filled crown with decay, 3=filled crown with no decay, 4=missing tooth as result of caries, 5= permanent missing tooth due to other reasons, 6=special crown, 7=unerupted crown/

tooth, 8=not recorded. The subject was regarded as in need of dental care if there was pain or clinical detectable infection or infection which could lead to severe disease if not treated. Coding was used for recording need of dental care. 0= No need of dental care, 1= Dental hygienist care, 2= Tooth extraction, 3= Tooth extraction with special care, 4= Difficult treatment. For statistical analysis it was regrouped into two categories: 0, 1-2-3-4.

### *Statistical analysis*

To describe the baseline characteristics according to gender cross tabulation was used. To compare means for various characteristics between men and women, independent sample t-test was used. To investigate association of self-rated health and oral health with base line characteristics chi square test was used. P value <0.05 was considered statistically significant. Binary logistic regression analysis was performed. Three models were created, all adjusted for sex. In the first model, self-rated health was included. Smoking was added to second model. In the third model education and heart diseases were added. The data was analysed with SPSS 19 for Windows.

## RESULTS

### *Baseline characteristics*

#### *Oral health Characteristics*

There were statistically significant gender differences in number of intact teeth ( $p=0.003$ ), decayed teeth ( $p<0.001$ ) and DMFT index ( $p=0.013$ ) among dentate men and women. Association between baseline characteristics and self rated health. There was statistically significant association between self-rated health and economic situation. Association of self-rated health and need of dental care There was statistically significant association between education level and need of dental care. Self-rated health and need of dental care.

Model 1 shows that there was no association between self-rated health and need of dental care (OR 1.6 95% CI 0.67-4.2) from bad to good self-rated health. In Model 3 adding other variables to it (OR 2.5 95% CI 0.80-7.5) didn't changed the association between self-rated health and need of dental care. Excluding edentulous cases didn't changed association between self-rated health and need of dental care.

## DISCUSSION

The purpose of the present study was to examine oral health of older people and its association with self-rated health. There was no association between self-rated health and oral health status using need of dental care as indicator of oral health. Although previous studies reported association between self-reported

TABLE 1: BASELINE CHARACTERISTICS OF 80 YEAR OLD PEOPLE ACCORDING TO GENDER

Characteristic	Male (n=74) f (%)	Female (n=188) f (%)	X <sup>2</sup> Test P -value
Education			
School	57(80)	162(87)	
University	14(20)	24(13)	0.169
Economic situation			
Good	22(32)	46(25)	
Fair	48(58)	114(63)	
Bad	6(9)	18(10)	0.777
Marital status			
Unmarried	2(3)	32(17)	
Married	51(69)	34(18)	
Widow/Divorced	21(28)	122(65)	<b>&lt;0.001</b>
Self rated health			
Good	13(19)	27(15)	
Fair	39(57)	113(63)	
Bad	16(24)	14(22)	0.673
Heart diseases			
Yes	32(49)	107(69)	
No	34(51)	48(31)	0.004
Smoking			
Current			
No	56(81)	177(99)	
Yes	13(19)	1(1)	<b>&lt;0.001</b>
Earlier			
No	12(22)	156(89)	
Yes	42(78)	19(11)	<b>&lt;0.001</b>
Number of years			
No	13(25)	158(95)	
>1	39(75)	9(5)	<b>&lt;0.001</b>

Bold values indicate  $p \leq 0.001$ .

TABLE 2: ORAL HEALTH CHARACTERISTICS OF 80 YEAR OLD DENTULOUS PARTICIPANTS

Characteristic	Men (n=22) mean±SD	Women (n=52) mean±SD	P value
Number of intact teeth†	7.80±5.08	4.57±3.20	0.003
Number of decayed teeth†	6.79±4.35	2.21±1.77	<b>&lt;0.001</b>
Number of filled teeth†	6.09±4.26	8.00±5.99	0.180
DMFT†	29.49±4.63	30.72±2.63	0.013

† t- test for independent samples

SD Standard deviation

TABLE 3: ASSOCIATION OF BASELINE CHARACTERISTICS WITH SELF-RATED HEALTH AMONG 80-YEAR OLD PEOPLE

Characteristic	Good (n=40) f (%)	Fair (n=152) f (%)	Bad (n=56) f (%)	X <sup>2</sup> Test P -value
Education				
School	36(90)	127(85)	48(86)	
University	4(10)	23(15)	8(14)	0.692
Economic situation				
Good	19(47)	41(28)	9(16)	
Fair	18(45)	96(64)	37(67)	
Bad	3(8)	12(8)	9(17)	<b>0.001</b>
Marital status				
Unmarried	8(20)	20(13)	3(5)	
Married	9(22)	46(30)	24(43)	
Widow/Divorced	23(58)	86(57)	29(52)	0.104
Heart diseases				
Yes	17(57)	82(62)	38(75)	
No	13(43)	50(38)	13(25)	0.187
Smoking Current				
No smoking	38(95)	141(95)	52(93)	
Yes	2(5)	8(5)	4(7)	0.868
Earlier				
No smoking	24(65)	106(76)	36(72)	
Yes	13(35)	34(24)	14(28)	0.408
Number of years				
No smoking	25(71)	107(80)	37(77)	
> 1 year	10(29)	27(20)	11(23)	0.558

Bold values indicate  $p \leq 0.001$ .

TABLE 4: ASSOCIATION OF SELF-RATED HEATH AND NEED OF DENTAL CARE

	No n(=141) f(%)	Yes n(=85) f(%)	X <sup>2</sup> Test P -value
Self rated health			
Good	17(13)	14(17)	
Fair	81(60)	52(63)	
Bad	36(27)	17(20)	0.467
Smoking			
Current			
No	124(90)	80(96)	
Yes	10(8)	3(4)	0.246
Earlier			
No	88(71)	57(73)	
Yes	35(29)	21(27)	0.813
Number of years			
No smoking	90(75)	58(81)	
> 1 year	30(25)	14(19)	0.375
Education			
School	128(93)	60(71)	
University	10(7)	24(29)	<0.001
Economic situation			
Good	33(25)	29(35)	
Fair	86(65)	45(54)	
Bad	14(10)	9(11)	0.253
Heart diseases			
Yes	86(63)	52(63)	
No	50(37)	31(37)	0.931

Bold values indicate  $p \leq 0.001$ .

TABLE 5: ASSOCIATION BETWEEN SELF-RATED HEALTH AND NO NEED OF DENTAL CARE AMONG 80 YEAR OLD PERSONS IN LOGISTIC REGRESSION ANALYSIS SEX ADJUSTED

Variables (ref)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Self rated health			
Bad vs Fair	1.22 (0.55-2.71)	1.34 (0.56-3.23)	1.38 (0.54-3.50)
Bad vs good	1.68 (0.67-4.22)	2.15 (0.77-6.01)	2.50 (0.80-7.56)
Sex (male)	1.40 (0.76- 2.56)	6.85 (1.88-24.91)	6.81 (1.79-25.81)
Smoking (Never vs ever)		6.55 (1.70- 25.26)	7.40 (1.80-30.34)
Education (school)			0.14 (0.05-0.37)
Some heart disease (No)			1.01 (0.51-2.03)

Note: Model 1 adjusted for sex Model 2 adjusted for sex and smoking; Model 3: Model 1 + Model 2 + adjustment for education and heart diseases

oral health status and self-rated health. Participants with good self-rated health reported good self-reported oral health on the other hand those with bad self-rated health reported poor oral health but no association was found to other health variable.<sup>3,14</sup> The studies showed positive association between self-reported oral health and self-rated health, but at the same time it contradicts with present study which showed no association of self-rated health and need of dental care. In comparison to afore mentioned study there are certain limitations in study design and sample.

Unfortunately no previous studies were evident to support the knowledge of present study. The possible explanation for no association between self-rated health and oral health could be that present study includes clinical measures or examinations by dentists and therefore result pertains only to association found between clinical measures not including self-reporting of oral health. There is no way of knowing to what extent these clinical measures correspond with participant self-reporting general health. Need of dental care is one aspect of oral health.<sup>21,5</sup> It is possible that other indicators of oral health are more closely associated to participant's self-rated health. In addition, treatment needs were solely based on clinical criteria of diagnostic needs and it didn't included perceived needs. There was large number of edentulous persons in the present study. So we excluded edentulous cases and analysed the relationship between self-rated health and oral health but it didn't changed and remain the same. However, the dental status of Finnish adult population has changed considerably in current decade and there is decrease in prevalence of edentulism and increase in number of persons with complete dentition.<sup>22,23</sup> The dental findings could be much better analyzed if there were not many edentulous cases in present study. An interesting fact seen during data analysis process was that there was non significant association of self-rated health with need of dental care ( $p=0.467$ ). Moreover, majority of participants with need of dental care 63%

have fair self-rated health while 20% were having bad self-rated health.

Oral health characteristics among men and women showed significant differences in number of intact teeth, number of decayed teeth and DMFT index scores. There were high proportion of edentulous subjects about 56% of men had no teeth and 60% of women were without teeth. However, no significant differences were found in edentulous and number of filled teeth's among gender. The best possible explanation for such high number of edentulous cases could be that smoking is most significant cause of tooth loss. Previous research supports the present findings and reported that smoking is significantly associated with tooth loss and there is high prevalence of decayed teeth in smokers as compared to non-smokers.<sup>16</sup> Another explanation could be that previously dental infections were treated by extractions rather than complex endodontic procedures and obtaining dentures might be the reason for extractions in women. The higher trends in number of filled teeth's showed that participants were well educated and have good socio-economic status and may have access to quality dental care.

The present study has certain limitations and should be considered when planning future research. There was large proportion of edentulous participants and uneven distribution among gender. The findings could much better analyzed if the participants were not too old. The strength of the study is that it is among one of the few studies relating self-rated health with oral health. The sample used in the study is representative of general elderly population. The oral health measure used in the present study precisely shows the actual oral health status of older people. Previous studies have shown that oral health judged by dentists is accurate than reported by people themselves.<sup>1</sup>

## CONCLUSION

The present study examines oral health among older people and showed no association between self-rated



health and oral health. It explains that dental care at old age could affect not only oral health but also can affect individual senses of general health. Future studies should be carried to investigate and reveal more information on oral health and self-rated health.

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