

Association Among Oral Health And Sex, Age And Comorbidity At Geriatric Population in Macedonia with Total And Partial Dentures

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Abstract:

Introduction. Oral health is important component of general health. Socio-demographic characteristics are one of the important factors for perception of oral health and quality of life. Main purpose of this study was to perform association among oral health and sex, age and comorbidity at geriatric patients (older than 65) with built-in oral prosthetic dentures.

Materials and methods. The survey was a prospective transversal (cross-sectional) study conducted among 165 institutionally sheltered patients at Gerontology Institute (inspected group – IG) and 170 patients from the dental specialist clinics (control group CG) at age 65 and older. Statistical program SPSS for Windows ver. 13.0 was used for statistical processing.

Results and discussion. Patients with upper and lower total dentures dominated (43,6% vs. 26,5%). The sex has a significant influence on total GOHAI score ($p=0,026$). Male from IG had the highest GOHAI score (30,70), while the lowest score was at the female CG (28,08). Age had no significant influence on total GOHAI score ($p=0,53$). CG patients aged >85 had the highest GOHAI score (30,33), while the lowest score had the CG aged 75-79 patients (27,86). Patients from both groups with positive history of chronic diseases had highly significant higher total mean GOHAI scores than those without.

Conclusion. Oral health at geriatric patients is at unsatisfactory level, with significant influence of the sex, age and comorbidity.

Keywords: age, comorbidity, oral health, sex

I. Introduction

Reducing of mortality at middle age population, population groups over 65, over 75 and over 85 are increasing. Older people are 3,5% of total population in the countries in development and up to 20% in developed countries. This proportion is increasing in countries in development, and in developed countries is expected to reach up to 30%. [1]

These changes known as "population ageing" are results of the developed technological, biological, medical sciences and industry.

General health, oral health and health problems in such a conditions have new and fast approaches of solution, making better quality of life. [2]

At this population, it is inevitable to have chronic diseases as heart and cardio vascular system diseases, diabetes, nephrologic diseases, lowering the quality of life at adults. Chewing and speech difficulties at adults with lost teeth, lead to installing oral prosthetic dentures. [3,4,5] Globally, 15% of the adult population have total dentures.

Since the quality of life is directly connected to oral health and oral parameters, socio-dental indicators (questionnaires) are used to assess the clinical implication of oral disorders to social, physical and psycho-physical aspects of life, personal and subjective understanding of health and illness. [6,7] Accompanied chronic diseases together with sex and age at adult population over 65 might have serious implications to the oral health and quality of life.

Main purpose of this study was to perform association among oral health and sex, age and comorbidity at geriatric patients (older than 65) with built-in oral prosthetic dentures.

II. Materials And Methods

This transversal study, performed at population over 65 in a group of 165 patients from Gerontology Institute "13 November" – Skopje and a group of 170 patients from the dental specialist hospitals in the city of Skopje-Macedonia.

The patients were categorized into six prosthetics categories (subgroups):

- **Group 1** – Upper and lower total denture

- **Group 2** – Upper and lower partial denture
- **Group 3** – Upper partial and lower total denture
- **Group 4** – Upper total and lower partial denture
- **Group 5** – Upper or lower partial denture only
- **Group 6** – Upper or lower total denture only

SZO Oral health paper and GOHAI indicator were used as instruments. (Annex 1 and Annex 2)

The standardized GOHAI indicator consisted of 12 questions, grouped into three dimensions: physical, psycho-social and pain and discomfort. The answers ranged according to Lickert scale (0=never, 1=not often, 2=sometimes, 3=often, 4=very often) (Annex 2). Results can range 0-48, where the higher score the lower oral health and quality of life.

SPSS for Windows ver. 13.0 was used as statistical software for data processing. During computer analysis adequate statistical methodologies are used. The values for $p < 0,05$ were statistical significant, while the values for $p < 0,01$ were statistical highly significant.

III. Results

Analysis of the results in both groups showed that institutionally sheltered patients had significantly more often upper and lower total dentures compared to upper partial and lower total denture, upper or lower partial denture only and upper or lower total denture only. (Table 1, Fig. 1)

Table 1. Type of edentulous-IG/CG

Type of edentulous	Group				Total
	IG (Number of patients / percentage)		CG (Number of patients / percentage)		
Upper+lower total denture	72	43,64 %	45	26,47 %	117
Upper+lower partial denture	33	20,00 %	35	20,59 %	68
Upper partial and lower total denture	15	9,09 %	31	18,24 %	46
Upper total and lower partial denture	24	14,55 %	19	11,18 %	43
Upper or lower partial denture only	12	7,27 %	19	11,18 %	31
Upper or lower total denture only	9	5,45 %	21	12,35 %	30
Total	165	100,00 %	170	100,00 %	335

Pearson Chi-square=18,75 df=5 p=0,002

1/3 Pearson Chi-square=11,1 df=1 p=0,00086

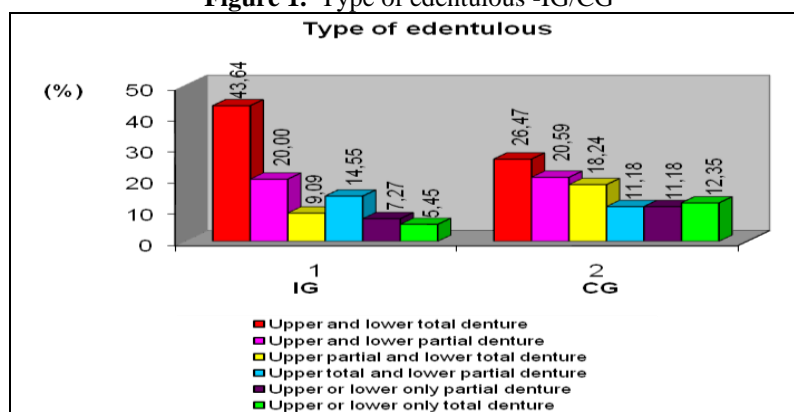
1/5 Pearson Chi-square=5,2 df=1 p=0,022

1/6 Pearson Chi-square=9,6 df=1 p=0,002

3/4 Pearson Chi-square=4,86 df=1 p=0,027

4/6 Pearson Chi-square=4,75 df=1 p=0,029

Figure 1. Type of edentulous -IG/CG



Results of ANOVA-MANOVA analysis for the influence of the sex are shown in Table 2 and showed that sex and their designation to IG or CG have significant influence to the total GOHAI score ($p=0,026$, $p=0,00056$). (Table 2)

Table 2. Anova-manova (total gohai score/sex)

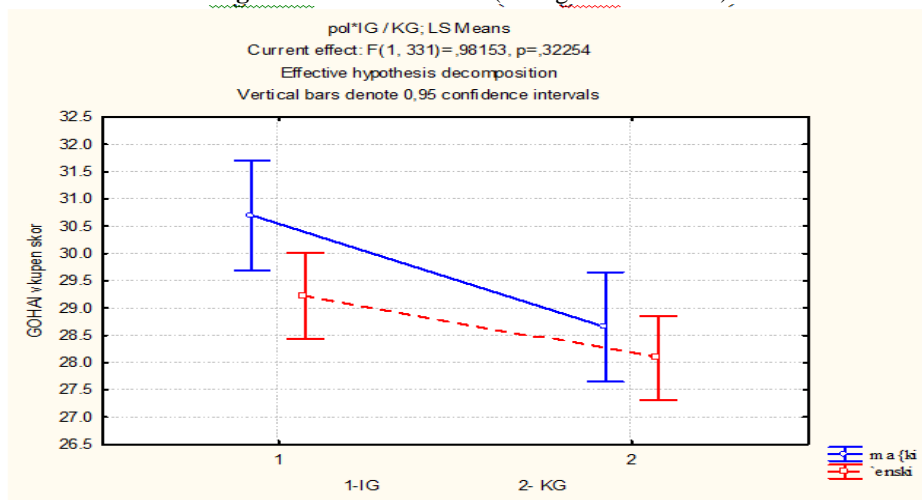
Univariate Tests of Significance for GOHAI total score					
	SS	Degr. of	MS	F	p
Intercept	267395,2	1	267395,2	16264,90	0,000000
Sex	81,7	1	81,7	4,97	0,03
IG / CG	199,8	1	199,8	12,15	0,00056
Sex*IG / CG	16,1	1	16,1	0,98	0,32
Error	5441,6	331	16,4		

Male patients of IG had highest GOHAI score, while the female from CG the lowest. (Table 3, Fig. 2)

Table 3. Anova-manova (total gohai score/sex)

Total GOHAI score						
Sex	IG/CG	mean	Std.Error	-95,00%	+95,00%	N
Male	IG	30,70	0,51	29,69	31,70	63
	CG	28,65	0,51	27,65	29,66	63
Female	IG	29,23	0,40	28,44	30,02	02
	CG	28,08	0,40	27,31	28,86	107

Figure 2. Anova-manova (total gohai score/sex)



Analysis of evaluation of the influence of the age of geriatric patients with built-in oral prosthetic dentures, sheltered in institutions and those of the dental clinics, to the quality of life, showed that age and their affiliation to the IG or CG did not have significant influence to the total GOHAI score (p=0,53, p=0,2). (Table 4)

Table 4. Anova-manova (total gohai score/age)

Univariate Tests of Significance for GOHAI total score					
	SS	Degr. of	MS	F	p
Intercept	127702,2	1	127702,2	7592,09	0,00
Age code	53,1	4	13,3	0,79	0,53
IG/CG	27,3	1	27,3	1,62	0,20
Age code * IG/CG	26,0	4	6,5	0,39	0,82
Error	5466,6	325	16,8		

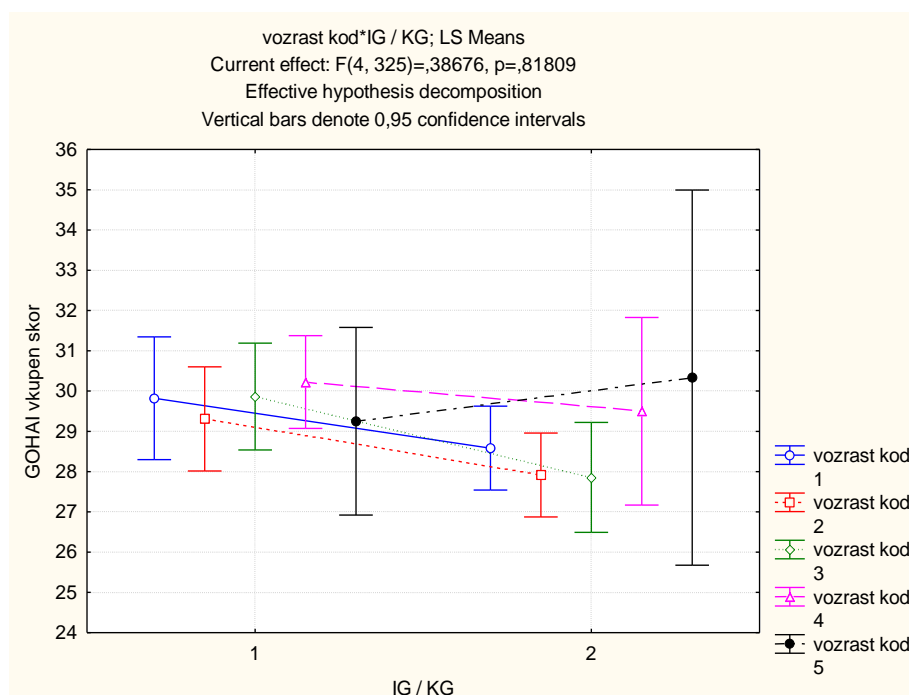
Highest GOHAI score was found at the patients of CG aged >85, while the lowest value was recorded at CG patients aged 75-79. (Table 5, Fig. 3)

Table 5. Anova-manova (total gohai score/age)

Total GOHAI score						
Age years	IG/CG	GOHAI mean	GOHAI Std. Error	GOHAI -95,00%	GOHAI +95,00%	N
		65-69	IG	29,82	0,78	
	CG	28,58	0,53	27,54	29,62	60
70-74	IG	29,31	0,66	28,02	30,60	39
	CG	27,92	0,53	26,88	28,96	60
75-79	IG	29,86	0,67	28,54	31,19	37
	CG	27,86	0,69	26,49	29,22	35
80-84	IG	30,22	0,59	29,07	31,38	49

	CG	29,50	1,18	27,17	31,83	12
> 85	IG	29,25	1,18	26,92	31,58	12
	CG	30,33	2,37	25,68	34,99	3

Figure 3. ANOVA-MANOVA (total GOHAI score/age)



Distribution of patients at IG in relation to the type of comorbidity is shown in Table 40. (Table 6)

Table 6. Comorbidity - IG

Frequency table				
	Count	Cumulative	Percent	Cumulative
No disease	26	26	15,76	15,76
Hypertension	11	37	6,67	22,42
Heart disease	33	70	20,00	42,42
Diabetes	47	117	28,48	70,91
Kidney diseases	33	150	20,00	90,91
Other diseases	15	165	9,09	100,00
Missing	0	165	0,00	100,00

IG patients with positive history of chronic diseases had highly significant higher total mean GOHAI scores than those without comorbidity (30,26±3,9 vs. 27,27±5,06).

The tested difference among the IG patients with and without comorbidity was statistically significant to the physical component of the quality of life (p=0,01), highly significant to the psycho-social component (p=0,001) and statistically insignificant to the aspect of feeling pain and discomfort (p=0,13).

The quality of life among these patients had significant differences in relation to the physical and psycho-social functioning, and had no significant difference in relation to the pain and discomfort. (Table 7)

Table 7. Tested differences - comorbidity IG

T-tests; Grouping: Comorbidity code (dentistry. IG.sta) Group 1: 1 Group 2: 0											
	Mean 1	Mean 0	t-value	df	p	Valid N	Valid N	Std. Dev.	Std. Dev.	F-ratio	p
Physical function	11,41	10,31	2,59	163	0,01	139	26	2,00	1,93	1,07	0,89
Psycho-social function	10,60	9,42	3,15	163	0,002	139	26	1,76	1,65	1,13	0,74
Pain and discomfort	8,25	7,54	1,52	163	0,13	139	26	2,11	2,63	1,56	0,12
Total GOHAI score	30,26	27,27	3,45	163	0,0007	139	26	3,85	5,06	1,72	0,05

Distribution of patients at CG in relation to the type of comorbidity is shown in Table 5. (Table 8)

Table 8. Comorbidity - CG

Frequency table				
	Count	Cumulative	Percent	Cumulative
No disease	21	21	12,35	12,35
Hypertension	23	44	13,53	25,88
Heart disease	29	73	17,06	42,94
Diabetes	41	114	24,12	67,06
Kidney diseases	42	156	24,71	91,76
Other diseases	14	170	8,24	100,00
Missing	0	170	0,00	100,00

CG patients with positive history of chronic diseases had highly significant higher total mean GOHAI scores than those without comorbidity (28,0±3,8 vs. 23,86±1,06).

The tested difference of CG patients with and without comorbidity was statistically highly significant in relation to all three components of quality of life. (Table 9)

Table 9. Tested differences - comorbidity CG

T-tests; Grouping: Comorbidity code (dentistry. CG.sta) Group 1: 1 Group 2: 0									
	Mean	Mean	t-value	df	p	Valid N	Valid N	Std. Dev.	Std. Dev.
Physical function	12,14	10,43	4,81	167	0,0000 03	148	21	1,53	1,43
Psycho-social function	8,99	7,90	2,88	167	0,005	148	21	1,69	0,89
Pain and discomfort	7,78	5,52	5,09	167	0,0000 01	148	21	1,98	1,21
Total GOHAI score	28,91	23,86	6,00	167	0,00	148	21	3,83	1,06

IV. Discussion

Fast tempo of living, bad and low quality food, high amount of uncontrolled stress cause numerous diseases of the different systems and tissues of the human body. It is the same case with the oral and dental tissue. In the recent time, disease of the masticatory organs are more often present, resulting in partial or total teeth loss. Because of this, prosthetic replacement of the lost teeth is necessary.

GOHAI indicator is a system for evaluation of quality of oral health and its influence to the quality of life, which is second most frequently used internationally, while it has not been used in Macedonia so far. This was one big challenge for this study.

Institutionally sheltered patients significantly more often had upper and lower total denture, compared to upper partial and lower total denture, upper or lower partial denture only and upper or lower total denture only.

In the study in India, Shgliad and Hebbal recorded that the most negative answers to the GOHAI indicator were given by the patients with prosthetic treatment from Group 1, followed by the patients from Group 2. Veyrone at al. in 2005 found a connection between GOHAI results and the new prosthetic treatments, explained by the improvement of the chewing coefficient. Opposite, Brazilian professor Bonan in 2008 in his study did not find statistically significant differences among the quality of life at elderly people and the prosthetic treatment.[7]

In this study females were dominant with 102 (61,8) at IG and 107 (62,9%) at the CG. The results among IG and CG were insignificant according to the sex. The age of the patients of IG was 65-92, with 65-87 in the CG. Institutionally sheltered had significantly higher average age than the patients from the dental clinics (76,34±6,6 vs. 72,3±5,1)

The sex of the patients had a significant influence to the quality of life. Male of IG had the highest GOHAI score, while the lowest was at the females of CG.

The male patients from IG had significantly higher average score compared to female from CG.

The age had no significant influence to the total GOHAI score. Highest value had the patients aged >85, while the lowest had the patients aged 75-79.

In addition, geriatric population also has other chronic diseases, which are not only in connection to the pain, but with functional, social and psycho-physical disabilities as well.

In this study, the IG patient with positive history of chronic diseases, had significantly higher total GOHAI scores compared to IG patients without comorbidity (30,26±3,9 vs. 27,27±5,06). Tested difference among patients with and without comorbidity was significant to the physical component, highly significant to the psycho-social component, and insignificant to the pain and discomfort. The quality of life of patients with

and without comorbidity was significantly different in terms of physical and psycho-social functioning, and was not significant to the feeling of pain and discomfort in mouth as a result of the built-in denture.

This study showed the fact that all other patients, except 15,76% of IC and 12,35% of CG, had other chronic disease in addition to the problems with the built-in dentures: diabetes, heart diseases, kidney diseases and hypertension. It can be concluded that the quality of life for patients with and without comorbidity was significantly different in relation to the three determinants.

V. Conclusion

According to the analysis of the total GOHAI score it can be concluded that the oral health is on unsatisfactory level. This is shown by the highest score of 40, while the maximal possible GOHAI score is 48. The largest is the number of patients with upper and lower total denture, than with upper and lower partial denture. The sex had significant and the age had insignificant influence to the quality of life at both groups.

Also quality of life and oral health of adult population over 65 in Macedonia, with and without chronic diseases in both groups had significant difference in terms of physical and psycho-social functioning.

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