



INFLUENCE OF THE AGE AND COMORBIDITY ON ORAL HEALTH AND QUALITY OF LIFE AT GERIATRIC POPULATION WITH TOTAL AND PARTIAL DENTURES IN REPUBLIC OF MACEDONIA

Natasha Stavreva, Ljuben Guguvchevski, Biljana Kapusevska

Department of Prosthetics, Faculty of Dentistry Skopje,
Ss.Cyril and Methodius University Skopje, Majka Tereza 17, 1000 Skopje, Republic of Macedonia
natasha_stavreva@yahoo.com

Department of Prosthetics, Faculty of Dentistry Skopje,
Ss.Cyril and Methodius University Skopje, Majka Tereza 17, 1000 Skopje, Republic of Macedonia
ljuben.guguvcevski@gmail.com

Department of Prosthetics, Faculty of Dentistry Skopje,
Ss.Cyril and Methodius University Skopje, Majka Tereza 17, 1000 Skopje, Republic of Macedonia
biljanakapusevska@gmail.com

ABSTRACT

Health and health condition are basic components of quality of life, and oral health connective part of the general health. Age and comorbidity conditions are important co-factors for oral health and quality of life. Main purpose of this study was to evaluate the quality of life at geriatric population >65 in relation to the type of oral prosthetic dentures, present comorbidity and age in the Republic of Macedonia. The survey was a transversal study conducted among 165 institutionally sheltered patients at Gerontology Institute (inspected group – IG) and 170 patients from the University Dental Clinic (control group CG) at age 65 and older. Statistical program SPSS for Windows ver. 13.0 was used for statistical processing. Patients with upper and lower total dentures dominated (43,6% vs. 26,5%). 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. IG Patients had significant differences in relation to the physical and psycho-social functioning, while CG patients had significant differences in relation to all three dimensions of quality of life. Quality of life and oral health at geriatric patients are at unsatisfactory level, and patients in both groups with and without comorbidity had significant differences in terms of physical and psycho-social functioning and age in both groups has insignificant influence.

Indexing terms/Keywords

Total and partial dentures, GOHAI indicator, quality of life, age, comorbidity

Academic Discipline And Sub-Disciplines

Dentistry

SUBJECT CLASSIFICATION

Prosthodontics/Gerontology/Public Health

TYPE (METHOD/APPROACH)

Transfersal study

INTRODUCTION

Oral health affects different countries, cultures, sex structures, age groups, particularly the geriatric population (>65), which is a specific category, where its number is continually growing since the end of the last century.[1]

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, 2]

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. [3]

At this population, it is inevitable to have chronic diseases as heart and cardio vascular system diseases, diabetes, nephrology diseases, lowering the quality of life at adults. Chewing and speech difficulties at adults with lost teeth, lead to installing oral prosthetic dentures. [4, 5, 6] Globally, 15% of the adult population have total dentures.



Since the quality of life is directly connected to 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. [7, 8]

Age accompanied with chronic diseases at adult population over 65 have serious implications to the quality of life.

Main purpose of this study was to evaluate the quality of life at geriatric population >65 in relation to the type of oral prosthetic dentures, present comorbidity and age in the Republic of Macedonia.

MATERIALS AND METHODS

This transversal study, performed at population over 65 in a group of 165 patients from Gerontology Institute "13 November" – Skopje (Inspected group-IG) and a group of 170 patients from the Department of Prosthodontics at the University Dental Clinic in Skopje (Control group-CG) during two years-period.

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

GOHAI indicator was used as instrument of research. (Annex 1)

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.

RESULTS AND DISCUSSION

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)

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

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 University Dental Clinic, 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 2)

Table 2. 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 3)

Table 3. 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

Distribution of patients at IG in relation to the type of comorbidity is shown in Table 4. (Table 4)

Table 4. 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 between 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 between 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 5)

Table 5. Tested differences - comorbidity IG

T-tests; Grouping: Comorbidity code (stomatologija. 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 6. (Table 6)



Table 6. Distribution of patients at CG in relation to the type of comorbidity

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 ($28,0\pm 3,8$ vs. $23,86\pm 1,06$).

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 7)

Table 7. Tested differences - comorbidity CG

T-tests; Grouping: Comorbidity code (stomatologija. KG.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	0,000003	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	0,000001	148	21	1,98	1,21
Total GOHAI score	28,91	23,86	6,00	167	0,00	148	21	3,83	1,06

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 recent time, we more often have diseases of masticatory organs, as a result of the fast tempo of living, low quality food, and uncontrolled stress. All this leads to partial or total loss of teeth and a need of prosthetic treatment. 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.

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.

Institutionally sheltered geriatric patients and those from University Dental Clinic with built-in oral prosthetic dentures had significantly different quality of life in terms of psycho-social dimension.

Brazilian professor Bonan in 2008 in his study did not find statistically significant differences between the quality of life at elderly people and the prosthetic treatment. [8]

In the study in India in 2010, 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. [9] Harford at al. in 2009 found a connection between GOHAI results and the new prosthetic treatments, explained by the improvement of the chewing coefficient. [10] Similar, in Lithuanian study in 2009, Sonata using this index showed that psychological dimension highly affects the quality of life of institutionally sheltered patients with chronic diseases. [11]

In this study, the IG patient with positive history of chronic diseases, had significantly higher total GOHAI scores compared to IG patients without comorbidity ($30,26\pm 3,9$ vs. $27,27\pm 5,06$). Tested difference between 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.

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 University Dental Clinic ($76,34\pm 6,6$ vs. $72,3\pm 5,1$)

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.

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.

Analysis made in this study showed that quality of life of adult population over 65 with and without comorbidity in both groups had significant difference in terms of physical and psycho-social functioning.

REFERENCES

1. Petersen PE. World Health Organization global policy for improvement of oral health-World Health Assembly 2007. *International Dental Journal* (2008) 58, 115-121.
2. World Health Organization. Executive Board Meeting January 2007. Report on global oral health EB120/10 and draft resolution EB120.R5. Geneva: WHO; 2007.
3. Petersen PE. Priorities for research for oral health in the 21st century – the approach of the WHO Global Oral Health Programme. *Community Dent Health* 2005; 22: 71-4.
4. Petersen PE. Global research challenges for oral health. *Global Forum Update Res Health* 2005; 2: 181-4.
5. Raphael D, Brown I, Renwick R, Rootman I. Quality of life theory and assessment; what are the implications for health promotion. *Issues in Health Promotion Series*. University of Toronto, Centre for Health Promotion, 2004.
6. Michael I. MacEntee 2007; 138; 47S-52S *J Am Dent Assoc*. Quality of life as and Indicator of Oral Health in Older People.
7. Cohen L, Jago J. Toward the formation of sociodental indicators. *Int J Health Serv* 1976; 6(4): 681-98.
8. Bonan PR, Borges SP, Haikal DS. Unsatisfactory oral and rehabilitation conditions dissociated from quality of life perception in institutionalized and community-dwelling elderly. *Journal of Dental Science* 2008; 2: 115-119.
9. Shigli K, Hebbal M. Assessment of changes in oral health-related quality of life among patients with complete denture before and 1 month post-insertion using Geriatric Oral Health Assessment index. *Gerontology*. 2010; 27: 167-173.
10. Harford J. Population ageing and dental care. *Community dent Oral Epidemiol* 2009; 37(2): 97-103.
11. Vysniauskaite Sonata. Oral health behavior, conditions and care among dentate elderly patients in Lithuania: preventive aspects, 2009.
- 12.

Annex 1 – GOHAI indicator – Indicator for evaluation of oral health at geriatric population

General (Geriatric) Oral Health Assessment Index / GOHAI

1. How often did you limit the kinds or amounts of food you eat because of problems with your teeth or dentures?
2. How often did you have trouble biting or chewing different kinds of food, such as firm meat or apples?
3. How often were you able to swallow comfortably?
4. How often have your teeth or dentures prevented you from speaking the way you wanted?
5. How often were you able to eat anything without feeling discomfort?
6. How often did you limit contacts with people because of the condition of your teeth or dentures?
7. How often were you pleased or happy with the looks or your teeth and gums, or dentures?
8. How often did you use medication to relieve pain or discomfort from around your mouth?
9. How often were you worried or concerned about the problems with your teeth, gums or dentures?
10. How often did you feel nervous or self-conscious because of problems with your teeth, gums or dentures?
11. How often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures?
12. How often were your teeth or gums sensitive to hot, cold or sweets?



Author' biography with Photo



Dr. Natasha Stavreva completed her PhD from University "St. Cyril and Methodius" in Skopje-Faculty of Dentistry Skopje in Prosthodontics on "Estimation of mechanical fracture resistance of all-ceramic restoration in relation to the type of preparation and Ferrule effect". She did her post-graduation from the Medical Faculty in Skopje on Public Health and Gerontology.

