

## Menopause and Depression and Oral Health-Related Quality of Life of Postmenopausal Women

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### Abstract

*This study was to analyze the oral health-related quality of life in postmenopausal women and to provide basic data as the basis for improving quality of life measures. The subjects included 163 postmenopausal women aged 40 to 65 years, living in Busan and Gyeongnam from July 20 to September 30, 2014. Menopausal symptoms, depressive symptoms, dry mouth, monthly income, presence of systemic oral disease, use of dentures, and academic level appeared to affect the overall and oral health-related quality of life for postmenopausal women. Thus, menopausal women were to provide a basis for improving the quality of oral health-related life.*

**Keywords:** *Oral health impact profile (OHIP), Postmenopausal women, Menopausal symptoms, depressive symptoms, Xerostomia*

### 1. Introduction

The Middle - aged period occupied by the extended life expectancy today is relatively long[1]. Women live for more than a third of their lives with menopausal status. Before menopause, women who are maintaining their daily life with different health status is not considered that important [2-3], health care and treatment of postmenopausal women has emerged as a more important issue.

Menopause is a normal process of life that women experience, most women do not cope well, and there are changes in menopause that women suffer while experiencing middle age, old age, and associated physical changes [4-5]. In Korea middle-aged women experiencing menopausal symptoms, but relatively mild menopausal symptoms were reported significantly higher rate of about 94% [4]. The menopause is causing a lot of problems with the physical, emotional to middle-aged women with complications caused by natural aging process and menopause. Physical symptoms include facial flushing, sweating, headache, and weight gain, such as vaginal dryness appears and emotional symptoms may include depression, nervousness, weakness, forgetfulness, decreased libido, *etc.*, [6]. In addition, middle-aged women experience menopause and ovarian syndrome Cardiovascular System weakening disease, obesity, osteoporosis, such as physiological and social experience and a sense of discomfort can lead to psychological change memory loss, decreased concentration, and judgment, nervousness, depressed mood, showing a real increase in depressive tendencies[7].

Increase in age and menopause are also known to occur with oral symptoms like a dry mouth [8]. Xerostomia is the discomfort of dry food and chewing and swallowing of sense when you speak, even bad breath and dental caries, *etc.*, periodontal disease has a negative effect [9] like causing decreased emotional stability. Estrogen deficiency in this period, resulting in gingival inflammation, clinical attachment loss (Clinical Attachment Loss, CAL) acts more as a factor of menopause increased attachment loss increased, and

the lack of female hormones on bone density and bone loss also affect the loss of the tooth to increase [10-12].

In the case of middle-aged women, menopausal symptoms are more severe and can lead to a lower quality of life; alternatively, using preventive menopause management methods are related to higher quality of life [1]. With respect to the quality of life, 19.8% of women aged 20-29 years, 41.7% of women aged 40-49 years, and 64.5% of women aged over 60 years reported that their oral health was more important than any other health problems, suggesting that older women are more serious in accepting the importance of oral health [13].

Studies on menopause and depression and on their association with periodontal disease has a negative effect [9] on women's oral health-related quality of life which have been unprecedented [14]. In this study, we investigated the level of oral health-related quality of life for postmenopausal women using the OHIP-14 and analyzed depression and menopausal symptoms to understand the association between oral health and quality of life to provide a basis for improving women's quality of life, menopause experience, adaptation abilities, and overall oral health.

## 2. Materials and Methods

### 2.1. Research Subject and Design

A self-questionnaire was distributed to 180 subjects who agreed to participate in research, with the target demographic being middle-aged women (under 40 years of age) and women over the age of 65 living in Busan and Gyeongnam from July 20 to September 30, 2014. Self-assessment responses to the survey data were then collected. Of those surveyed, data from 163 subjects were used for analysis, with 17 exclusions due to unclear answers.

### 2.2. Research Tools

For the questionnaire used in this study, there were 12 questions on demographic characteristics, 6 questions on xerostomia, 14 questions regarding how oral health is reflected in the quality of life measurement tool, and 6 questions on depressive symptoms, 23 questions related to menopausal symptoms.

Xerostomia is (no oral dryness) 0 points in six questions to get to know the degree of oral dryness, 10 (very severe oral dryness) as small visual analogue scale; was used (Visual Analogue Scale VAS). The scores with participants directly to V show the level of their oral dryness, in a straight line was a higher score which means severe xerostomia. Reliability measurement in this study was Cronbach's  $\alpha = 0.80$ .

Oral oral health impact factor for health-related quality of life was evaluated using the OHIP-14 derived from Slade (1997). Oral health status on daily life physical, mental, and tools to measure items to measure the perceptions of the social impact of functional limitations, physical pain, psychological discomfort, decreased physical ability, mental capacity degradation, deterioration of social skills, social isolation, *etc.*, 7 consisted of sub-areas. Each question means 1 point (Highly agree) 5 (not at all) on a 5-point scale, with higher scores with oral health-related quality of life is high. Confidence in the OHIP-14 items in this study were measured by Cronbach's  $\alpha = 0.774$ .

Depression is a reliable and a valid measurement tool validated by Korean version Beck Depression Inventory which was used for BDI (Beck Depression Inventory). BDI is a self-report status to determine the level of depressive symptoms showing one of the four sentences consisted of a total of 21 questions. Each question will state the range of scores from 0 to 3 points by adding a 4 point scale is not depressed with 0-9 points, 10-15 points

mild depressive state, 16 to 23 points, severe depressive state, 24-63 points mean a severe depressed state.

Menopause symptoms are recognized internationally. Sarrel[11], a measurement tool in use which was developed for menopausal symptoms index (MENSI; Menopause Symptom Index) to Jo and Lee[12], was modified by Koreans, complementing a 20 question tool the menopause symptoms and Han[9] is modified, supplemented by the tools of the three questions were summed up using a total of 23 questions.

Sub-regions of tools consisted of three areas of physical symptoms, psychological symptoms, sexual symptoms, each question is 'no' zero 'is often' one point 'is often' two-point with the lowest points, the highest 46 the range of points. A higher score indicates a severe menopausal symptoms. In a study of reliability of the tool was Han Cronbach's  $\alpha = 0.90$ , was this study Cronbach's  $\alpha = 0.86$ .

### 2.3. Analysis

Data were analyzed using SPSS Window v.18.0 (SPSS Inc., Chicago, IL, USA). The frequency and percentages were calculated to identify the socio demographic characteristics of the study subjects. To analyze the oral health-related quality of life in the different demographic characteristics was performed by applying a one-way ANOVA by Scheffe's. To analyze oral and related factors and their influence on health-related quality of life, multiple regression analysis was performed. Statistical significance was determined by  $p$ -values less than 0.05.

## 3. Results and Discussion

### 3.1. Results

**Table 1. The General Characteristics of the Study Subjects**

Subjects	Division	N	(%)
Age	40~49	39	24.1
	50~59	113	69.8
	60<	10	6.2
Education	Middle school less than	14	8.6
	High school less than	78	47.9
	College graduates	71	43.6
Monthly income	<100	38	23.3
	100~200	37	22.7
	200~250	29	17.8
	250 ≤	59	36.2
Number of children	1 people	62	38.0
	2 people	83	50.9
	3 people more	18	11.0
Systemic disease	Have	49	30.1
	Not	114	69.9
BMI	Underweight	30	18.4
	Normal	115	70.6
	Overweight	18	11.0
Denture	Have	23	14.1
	Not	140	85.9

Implant	Have	19	11.7
	Not	144	88.3
General health	Very healthy	37	22.7
	Good health	71	43.6
	Usually	37	22.7
	Unhealthy	16	3.7
	Not very healthy	2	1.2
Oral Health	Very healthy	16	9.8
	Good health	52	31.9
	Usually	57	35.0
	Unhealthy	35	8.0
	Not very healthy	3	0.7
Menopause Symptoms	Have	54	33.1
	Not	109	66.9

Characteristics of the study subjects had an average age of 52.72 years a total of 163 subjects ( $\pm 5.58$ ), educational level accounted for 47.9%, less than high school ", the most common monthly income of 23.3%, less than 1 million won. In 50.9% of the total number of children subject has accounted for two people was 69.9% higher distribution in subjects with systemic disease. Obesity is 'normal' at 70.6%, 'underweight' at 18.4%, 'overweight' in the order of 11% was found in the oral cavity equipped with water, equipped with a denture subjects, 14.1%, "one person implant" is 11.7% was occupied. General health is "a good health, 43.6%, oral health is 'usually' found in 35% of the 'persons with menopausal symptoms, 33.1%, accounting for' non-participants who have menopausal symptoms, is 66.9% (Table 1).

**Table 2. Dry Mouth Symptoms**

Division	Mean	SD
When you wake in the morning from a full night's sleep, do you feel that your mouth is dry?	4.47	2.44
Do you feel that your mouth is more dry than usual during the day?	4.26	2.34
Do you feel that your mouth is dry when you eat?	3.94	2.62
Does the dryness of your mouth give you difficulty when swallowing food?	3.53	3.14
Do you feel that the amount of saliva in your mouth is ever insufficient?	3.88	2.91
How much is your overall sense of everyday discomfort due to symptoms of dry mouth?	3.82	2.80
Total score	23.90	13.15

The dry mouth symptom total score was  $23.90 \pm 13.15$ . Scores for questions related to waking up indicated that the most common score for feeling dry mouth was  $4.47 \pm 2.44$ , and the score for your mouth feeling as dry as usual during the day was  $4.26 \pm 2.44$ . The response to the mouth feeling dry when the meal appeared was  $3.94 \pm 3.14$ , not (Table 2).

**Table 3. The Correlation between Menopause and Depression and Dry Mouth Symptoms**

Division	Physical symptoms	Mental symptoms	Sexual symptoms	Depression	Dry mouth symptoms
Physical symptoms	1				
Mental symptoms	0.842**	1			
Sexual symptoms	0.778**	0.758**	1		
Depression	0.086	0.097	0.064	1	
Dry mouth symptoms	0.352**	0.314**	0.369**	0.148	1

\*\*p<0.01, by Pearson's Correlation

Physical symptoms of mental symptoms in menopausal symptoms ( $r = 0.842$ ), sexual symptoms ( $r = 0.778$ ), showed a correlation of dry mouth symptoms (0.352) and positive, emotional symptoms in menopausal symptoms, sexual symptoms ( $r = 0.758$ ), dry mouth symptoms (0.314) and showed a positive correlation. Sexual symptoms in menopausal symptoms showed a positive correlation with dry mouth symptoms ( $r = 0.369$ ) (Table 3).

**Table 4. Menopause and Depression and Symptoms of Dry Mouth in General Characteristics**

Division	N(%)	Menopausal symptoms		Depressive symptoms,		Dry mouth symptoms	
		Mean±SD	P-value	Mean±SD	P-value	Mean±SD	p-value
Age*	40 to < 50	39(9)	0.92±4.13 <sup>a</sup>	5.79±6.1 <sup>a</sup>		26.18±15.26	
	50 to < 60	113(26)	5.65±8.94 <sup>a</sup>	7.50±7.70 <sup>a</sup>	0.000	22.49±12.26	0.083
	60 to <	10(2.3)	17.8±8.56 <sup>b</sup>	14.70±8.33 <sup>b</sup>		30.50±12.66	
Education	Middle school less than	14(8.6)	19.86±11.49 <sup>a</sup>	10.36±9.47		26.29±14.32	
	High school less than	78(47.9)	6.76±8.68 <sup>ab</sup>	8.86±7.35	0.002	25.47±13.98	0.167
	College graduates	71(43.6)	0.99±3.62 <sup>b</sup>	5.65±7.13		21.69±11.75	
Job	Have	109(66.9)	3.63±7.31	7.27±7.52	0.0	24.3±13	0.576
	Not	54(33.1)	8.87±10.76	8.24±7.83	0.02	23.07±13.52	
Monthly income*	<100	38(23.3)	8.11±11.47 <sup>b</sup>	9.79±8.59 <sup>a</sup>		21.97±13.39	
	100~200	37(22.7)	7.19±9.94 <sup>b</sup>	9.27±7.79 <sup>ab</sup>	0.006	21.76±12.01	0.220
	200~250	29(17.8)	1.10±3.88 <sup>a</sup>	4.62±5.03 <sup>ab</sup>		23.52±11.45	
	250≤	59(36.2)	4.56±7.27 <sup>ab</sup>	6.58±7.38 <sup>b</sup>		26.66±14.23	

Number of children*	1 people	62(38)	3.02±7.93		5.34±5.37 <sup>a</sup>		21.19±11.72	
	2 people	83(50.9)	6.99±8.98	0.027	8.71±8.33 <sup>ab</sup>	0.009	24.86±14.04	0.062
	3 people more	18(11)	6.00±10.50		10.17±9.08 <sup>b</sup>		28.78±12.11	
Systemic disease <sup>c</sup>	Have	49(30.1)	11.67±1.15	0.00	12.35±8.30	0.00	27.71±3.65	0.01
	Not	114(69.9)	2.66±6.05		5.54±6.31		22.25±2.64	5
Denture	Have	23(14.1)	14.43±1.24	0.00	14.78±7.30	0.00	28.48±2.23	0.07
	Not	140(85.9)	3.88±7.54		6.41±7.01		23.14±3.18	1
Implant	Have	19(11.7)	4.74±7.87	0.744	9.26±8.33	0.309	23.37±3.67	0.85
	Not	144(88.3)	5.45±9.07		7.37±7.52		23.97±3.12	3
Total		163(100)	5.37±8.92		7.59±7.61		23.90±3.15	

\*The same characters was not significant by Scheffe's multiple comparisons at  $\alpha=0.05$

<sup>†</sup>p-values by t-test or ANOVA.

Menopause symptoms of the subjects were 5.37 points, 7.59 points with depressive symptoms, with signs of dry mouth were 23.90 points. Menopause and Depression Symptoms and dry mouth symptoms in the age group 60 years and older (17.8 points, 14.7 points) than at the middle school level of education higher than those under 60 years of age group (19.86 points, 10.36 points) and those without a job in the profession (8.87 points, 8.24 points), less 1 million won in monthly income group (8.11 points, 9.79 points), was significantly higher in the ( $p < 0.05$ ). Number of children from birth menopause symptoms, 2 patients (6.99 points), three or more depressive symptoms (10.17 points) in the group with systemic diseases were high (11.67 points, 12.35 points, 27.71 points) patients without systemic disease (2.66 points, 5.54 points, 22.25 points) was higher than both menopause and depression, dry mouth symptoms ( $p < 0.05$ ). Equipped with an intraoral denture group (14.43 points, 14.78 points, 28.48 points) did not mount the denture group was significantly higher than that (3.88 points, 6.41 points, 23.14 points) (Table 4) ( $p < 0.05$ ).

**Table 5. Factors Affecting the Quality of Life of Postmenopausal Women**

Characteristic	$\hat{\alpha}$	t	p
Dry mouth symptoms	-0.222	-2.993	0.003
Monthly income	0.181	2.219	0.028
Systemic disease	-0.238	-2.606	0.010
Dentures	0.175	2.109	0.037
Implants	0.113	1.508	0.134
Academic level	0.253	2.557	0.012
Menopause symptoms	-0.018	-0.182	0.855

$F = 4.034$  ( $p < 0.001$ ),  $R^2 = 0.278$ ,  $\text{adj. } R^2 = 0.209$

The multiple regression analysis determined that there was an effect on oral health-related quality of life in postmenopausal women, based on presence of dry mouth, amount of monthly income, presence of systemic oral disease, presence of dentures, and education level. The factor that was found to have a significant impact on oral health-related quality of life was demonstrated to be giving, with explanatory model power being 27.8% ( $p < 0.050$ ) (Table 5).

### 3.2. Discussion

When discussing the results of this study attempting to investigate the impact of oral health-related quality of life according to menopausal symptoms in postmenopausal women with depression targets, the focus were as follows: Menopausal age of Korea Institute for postmenopausal women, according to the year 1994 is 48 years old and have been reported [2]. 2011 National Health Insurance research in the country average menopause age is  $49.4 \pm 5.1$  years old and the average age of menopause is 53 years of the study subjects with similar results in the menopausal age of women which is being extended. The menopause status and health care provision considered necessary for health improvement program.

Menopausal symptoms, according to the demographic characteristics of menopausal symptoms in the age group 60 years and older was higher than the 6.5 points to 17.8 points in group ( $p < 0.001$ ). This group is higher than in the middle school level of education but lower than the education menopausal symptoms by 19.86 points ( $p < 0.001$ ). Park is consistent with the results of study [4], El Shafie[1] studies, such as this study showed similar results of women with menopausal symptoms that are closely related to the age and educational level. Educated level has more menopausal symptoms than the high group with low group that appeared to be with no significant differences according to the educational level, the repeat studies are needed for subsequent education and menopausal symptoms.

Park's study[10] showed the highest score by an average of 23.9 points. The xerostomia average of the study conducted in adults targeted postmenopausal women with 19.44 points in the study.

The results of this study revealed an estrogen decrease due to menopause, among other physical and psychological changes with physical symptoms. This is due to the moisture being depleted in the body in order to prevent dryness, which leads to increased incidence of caries or periodontal disease appearing during regular dental examinations; oral saliva training is needed to promote its secretion.

Underlying factors of the physical symptoms of menopause symptoms is seen in the results correlated with the degree of female menopause, menopausal symptoms, depression, mental symptoms, sexual symptoms and depressive symptoms of menopause, the greater the degree of depression the higher the correlations. Han [3], Kim [15] studies depressive symptoms and menopausal symptoms in postmenopausal women as a result, they were able to determine the factors that influence each other to be mentally healthy through menopause symptom relief interventions. This reduces the negative symptoms of depression considered necessary for the development of various programs menopause.

Menopausal symptoms, depressive symptoms and xerostomia with the findings of previous oral health-related quality of life can be changed through alternative and preventive management of menopause in postmenopausal women, improve the quality of life and promote developmental program. Limitations of the study as it is not enough to generalize the results to represent the total menopausal women, it is necessary to examine more generalized sample size and widen the local distribution, Subsequent studies suggested that to conduct a study of objective information about oral health and oral health-related quality of life, assess the relevance dry mouth through oral examination not only in an objective survey. This study was valuable in understanding the quality of life in postmenopausal women. Future research will seek to provide valuable evidence for the

association between symptoms of xerostomia and self-perception of quality of life in menopausal women.

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