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# Educational program to improve quality of life among elderly regarding oral health

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## ABSTRACT

**Background:** The ratio of elderly is rising faster than that of any other age group. The mutual relation between oral health and general health is specially stated among older people. Poor oral health affects negatively the quality of life among elderly. This study aimed to evaluate the effect of educational program on quality of life among elderly regarding oral health.

**Methods:** A quasi-experimental pretest-and-posttest design was utilized in the geriatric social club in Zagazig City. A purposive sample of 75 elderly subjects who fulfilled the study inclusion criteria. Five tools were used as follow: Tool I: A structured interview questionnaire to assess elderly's demographic characteristics, Tool II: Elderly oral health knowledge structured interview questionnaire, Tool III: Elderly oral self-care practices questionnaire and checklist, Tool IV: The Oral Health Assessment Tool (OHAT) For Non –Dental Professional, and Tool V: Oral Health Impact Profile (OHIP-14) Short Version.

**Results:** It revealed that the participants' age ranged between 60 and 82 years, with mean  $69.25 \pm 7.53$  years, with more women. Also, the results showed post-program statistically significant improvements in oral health knowledge, oral self-care practices, oral health assessment, and OHRQoL scores ( $p < 0.001$ ). The follow-up phase showed some decline in improvement but still significantly higher compared to the pre-program levels ( $p < 0.01$ ).

**Conclusion:** The oral health educational program is effective in improving the elderly's quality of life.

## 1. Introduction

Ageing is a natural process that is a biological fact and largely beyond human control. According to the world health organization (WHO), the worldwide populace is expanding at the yearly rate of 1.7%, while the population of those over 65 years is increasing at a rate of 2.5% [1]. This demographic change produces heavy challenges to health authorities and social planners due to the fast rate burden of chronic diseases including oral diseases among the elderly [2].

The Canadian Dental Association defines oral health as a state of the mouth and related tissues and structures that positively affects physical, mental and social well-being and enjoyment of life's possibilities by allowing the individual to speak, eat and socialize without pain, discomfort or confusion [3]. Dental health of older adults is a basic need that is increasingly neglected with advanced age, debilitation, and

limited mobility. The most common oral health problems encountered by the elderly are teeth loss, dental caries, gingivitis, periodontitis, xerostomia, oral lesions, and dental problems [4]. Oral health is integral to general health. Poor oral health is defined as a risk factor for dehydration and malnutrition, as well as a number of systemic diseases, including pneumonia, joint infections, cardiovascular disease, and poor glycemic control in type 1 and type 2 diabetes [5]. Likewise, this systemic diseases and/or their medications' side effects can lead to increased risk of oral diseases, xerostomia, and changed taste sensation [6].

Oral health problems have social, economic and psychological consequences that affect quality of life [7]. Oral health related quality of life is an integral part of general health and well-being and is recognized by the WHO as an important segment of the Global Oral Health Program [8]. OHRQoL was defined as a self-report specifically

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pertaining to oral health capturing both the functional, social and psychological impacts of oral disease [9]. There is another definition that conceptualizes OHRQoL mentioning that it reflects people's comfort when eating, sleeping and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health [10].

The OHRQoL is highly individual and should be evaluated according to the structure of elderly's conditions, sociocultural environments, own experiences and mental status because it is related to daily life and is unique to each individual, even elderly with severe conditions can report having good quality of life. Additionally, Quality of Life is by itself multi-faceted, showing variation over time for each individual [11]. Nurses play an essential role in enhancing elderly oral health and be an important component of a successful oral hygiene program. The knowledge and skills of nurses make them act as counselors for procedure and program development, determine oral care needs of elderly, develop individualized care plans, provide clinical hygiene treatment, make referrals to dentists, and implement oral health programs [1].

1.1. Research hypothesis

The quality of life among the elderly regarding oral health will be improved after the implementation of the educational program.

2. Subjects and methods

2.1. Administrative and ethical considerations

Formal permission for data collection and implementation of the oral health educational program was obtained by submission of official letters issued from the Dean of the Faculty of Nursing at Zagazig University to the president of administration council of Assembly of Health Improvement in Sharkia Governorate and to the director of the Geriatric Social Club in Zagazig City. The researcher met the director of the club, explained to him the study aim, its importance and its procedures, and asked for his cooperation. A verbal agreement for participation of the elderly was taken. They had the opportunity to refuse the participation, and could recede at any stage of the data collection interviews; also they were assured that the information would be confidential and used for the research purpose only. The researcher assured maintaining anonymity and confidentiality of subjects' data. The researcher phone number and all possible communicating methods were available for any explanation.

2.2. Study subjects

The study was conducted at the geriatric social club, El-Mohafza Street in Zagazig City. Seventy five elder subjects were recruited according to the following inclusion criteria: Age: 60 years and older; Independent in performing their daily activity; Have no communication problems (speech and hearing problems); and Attending the geriatric social club regularly.

2.3. Tools of data collection

Tool I: A structured interview questionnaire:

- It was developed by the researcher. It composed of five parts:
  - Part 1: Demographic characteristics of the studied elderly as; age, sex ... etc.
  - Part 2: History of chronic diseases, medications and oral health status.
  - Part 3: Data for periodic examination of the mouth as; frequency of dental visit, reason of last visit and causes of infrequent follow up.
  - Part 4: Dietary habits of the elderly as; following special diet, difficulty in eating, and fluids amount.

Table 1 Demographic characteristics of the studied elderly (n = 75).

Demographic characteristics	(n = 75)	
	No.	%
<b>Age group:/year</b>		
60–69	59	78.7
70–79	14	18.6
80 +	2	
Mean ± SD (range)	69.25 ± 7.53 (60–82)	2.7
<b>Gender:</b>		
Male	30	40
Female	45	60
<b>Marital status:</b>		
Married	39	52
Widow	27	36
Divorced	9	12
<b>Education:</b>		
Illiterate	3	4
Read and write	7	9.3
Basic education	7	9.3
Intermediate	31	41.4
University/Post graduate	27	36
<b>Occupation before retirement:</b>		
House wife or not working employee	30	40
	45	60

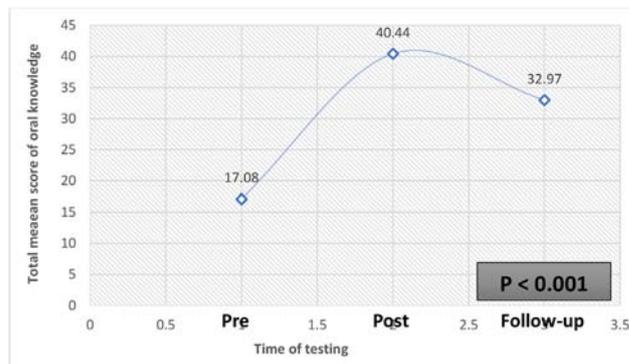


Fig. 1. Total score of Oral health Knowledge among the studied elderly (N = 75).

Part 5: Smoking habits of the elderly as; history of smoking, number of cigarette/day, and effect of smoking on teeth. .

Tool II: “Elderly Oral Health Knowledge Structured Interview Questionnaire” to assess the knowledge of the study subjects before and after the implementation of the oral health educational program. This tool was developed by [12].

Tool III: “Elderly Oral Self-Care Practices” [12]. It consisted of two parts:

Part 1: Oral Self-Care Practices Structured Interview questionnaire (assessment tool). It was used to assess the OSCP of the study subjects before and after the implementation of the oral health educational program.

Part2: Oral self-care practice observation checklist. an English form was filled out by the researcher to assess the oral self-care skills of the study subjects before and after the implementation of the oral health educational program. It included four procedures for elderly with natural and artificial teeth (teeth brushing, teeth flossing, denture care and oral cancer self-examination).

Tool IV: “The Oral Health Assessment Tool (OHAT) For Non-Dental Professional.”

This tool was developed by Ref. [13]; An English form to assess the oral health status of elderly.

#### Tool V: “Oral Health Impact Profile (OHIP-14) Short Version”.

It was developed by Ref. [14]; originally designed to assess the oral health related quality of life among elderly. It was translated into Arabic and approved to be valid and reliable ( $r = 0.94$ ) by Ref. [12].

#### 2.4. Statistical analysis

Sample was calculated by statistical computer program (Epi-Info software version 6.04) at power 80% and at confidence limit 95% and assuming the prevalence of poor oral hygiene among 600 elderly populations to be 69% [15] and the least percentage of improvement after the intervention program will be 10% then the sample should include 75 individuals.

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Paired Quantitative continuous data were compared using the paired *t*-test. The McNemar test was used to determine if there are differences on a dichotomous dependent variable. The Friedman is used to test for differences between groups when the dependent variable being measured is ordinal.

Qualitative categorical variables were compared using chi-square test. Pearson correlation was used for assessment of the inter-relationships among scales and quantitative variables. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones.

### 3. Results

The participants' age ranged between 60 and 82 years, with mean

69.25 ± 7.53 years, with more women (60%). In addition, 52%, 60%, and 41.4% of the studied elderly were married, worked as employees before retirement and had intermediate education respectively as shown in Table 1.

There is a statistically significant difference in total score of oral health knowledge of the studied elderly pre and post the educational program ( $P = 0.001$ ) as shown in Fig. 1.

The post-program phase demonstrated a statistically significant improvements in all oral self-care practice assessment ( $p < 0.001$ ). At the follow-up phase, the areas of significant improvements continued but with some slight declines in some of them as shown in Table 2.

There is a statistically significant difference in total score of Oral self-care practice observation among the studied elderly pre and post the educational program ( $P = 0.001$ ) as shown in Fig. 2.

The total score of oral health assessment among the studied elderly throughout the study phases decreased steadily and significantly as shown in Fig. 3.

The total score of OHRQOL among the studied elderly throughout the study phases decreased steadily and significantly. These improvements were statistically significant as shown in Table 3.

### 4. Discussion

The present study involved 75 elderly from the geriatric social club in El-Mohafza Street in Zagazig City to determine the effect of oral health educational program on oral health related quality of life among them by using a quasi-experimental pretest-and-posttest design. It was hypothesized that after implementation of the educational program, quality of life among the elderly regarding oral health will be improved.

Concerning demographic characteristics, the mean age of the elderly in the present study was 69.25 ± 7.53 which is close to the mean reported by [16] among elderly in Egypt (66.08 years). The same point

**Table 2**  
Oral self-care practice of the studied elderly [assessment tool] (n = 75).

Oral self-care practice	Pre (n = 75)		Post (n = 75)		Follow up (n = 75)		p <sup>#</sup>
	No	%	No	%	No	%	
<b>Cleaning frequency:</b>							
Non applicable	11	14.7	6	8	8	10.7	
Once per day (on waking)	30	40	5	6.7	4	5.3	< 0.001**1
Once per day (on sleeping)	9	12	28	37.3	22	29.3	< 0.001**2
Twice a day	15	20	31	41.3	30	40	> 0.05 <sup>3</sup> NS
After each meal	4	5.3	4	5.3	11	14.7	
During ablution	6	8	1	1.3	0	0	
<b>Cleaning duration:</b>							
Non applicable	11	14.7	6	8	8	10.7	< 0.001**1
< 2 min	53	70.6	16	21.3	16	21.3	< 0.001**2
≥ 2 min	11	14.7	53	70.7	51	68	> 0.05 <sup>3</sup> NS
<b>Teeth cleaning material:</b>							
Non applicable	11	14.7	6	8	8	10.7	
Tooth paste and brush	29	38.7	52	69.3	43	57.3	< 0.001**1
Miswak	5	6.7	6	8	5	6.7	< 0.001**2
Soap or salt and water	30	40	11	14.7	19	25.3	< 0.05 × 3
<b>Type of tooth Brush:</b>							
Non applicable	46	61.4	23	30.7	32	42.7	
Soft	8	10.7	44	58.7	38	50.7	< 0.001**1
Medium	14	18.7	8	10.7	5	6.7	< 0.001**2
Hard	7	9.3	0	0	0	0	> 0.05 <sup>3</sup> NS
<b>Period of change:</b>							
Non applicable	46	61.3	23	30.7	32	42.7	
Every two or three months	8	10.7	40	53.3	29	38.7	< 0.001**1
Every year	5	6.7	1	1.3	3	4	< 0.001**2
When Become lose	16	21.3	11	14.7	11	14.7	< 0.05 × 3

#:Fridman test NS: Non significant \*: Significant \*\*: Highly significant.

P1: Pre versus Post P2: Pre versus Follow up P3: Post versus Follow up.

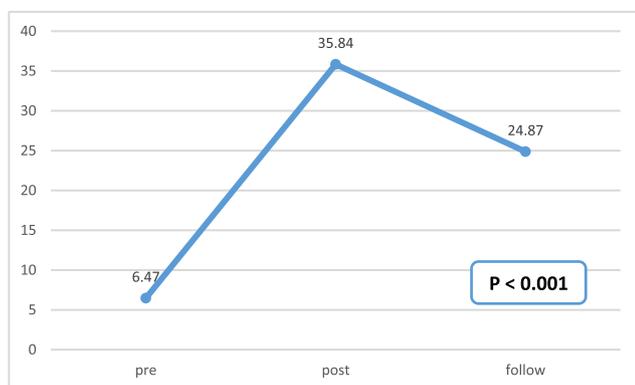


Fig. 2. Oral self-care practice (observational check list) among the studied elderly (N = 75).

is confirmed by [17] in western India who mentioned that the age range was between 60-82 years and the mean age was 69.4 years.

The findings revealed very deficient knowledge among studied elderly before commencing the educational program. This was noticed in all the tested knowledge areas such as the changes associated with aging, oral cancer, and the most common oral problems. In agreement with the present study finding, a study in USA by [18] revealed that the most participants were unfamiliar with concepts pertaining to periodontal disease, oral cancer, and oral health.

At the end of this study educational program, there were statistically significant improvements in elderly's knowledge. This indicates the effectiveness of the program in leading a positive change in their knowledge. This improvement was accompanied with little declines at the follow-up phase. This is expected considering the effect of ageing on memory, especially the short-memory. This comes in agreement with the results of a study in Melbourne, Australia where participants showed statistically significant improvements in participants oral health knowledge (18.4 vs. 23.3;  $p < 0.001$ ) [19].

Regarding the oral self-care practices observation checklists, the findings revealed inadequate practice among the studied elderly before commencing the program. This was noticed in all the observed procedures where all of them were unable to manage oral cancer self-examination procedure, the majority of them were unable to manage teeth flossing procedure, about two thirds of them were unable to manage teeth brushing procedure, and one third of them was able to manage only part of denture care procedure. This could be partly due to low knowledge and motivation regarding oral hygiene practices. On the same line, Ref. [20] in Ajman, UAE, found that the majority of elderly had inadequate oral self-care practices.

At the end of this study educational program, there were statistically significant improvements in elderly oral self-care practices with some declines were revealed at the follow-up phase. This indicates the

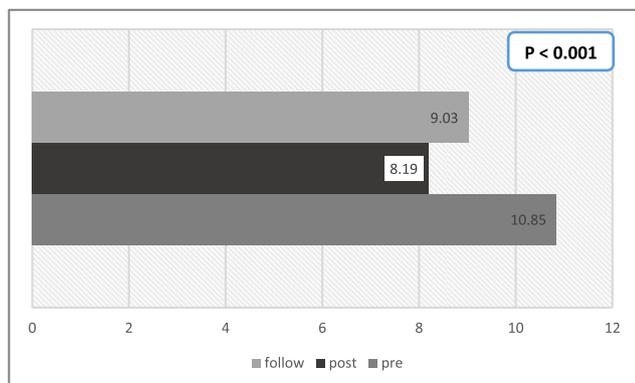


Fig. 3. The Oral Health status of the studied elderly (N = 75).

effectiveness of the program in leading a positive change in their practices. In the same line, Ref. [21] in Australia found that the participants showed significant improvements in self-care oral hygiene practices ( $p < 0.05$ ).

Before commencing the program, lips, gums and tissues changed in less than half of the studied elderly, while tongue, saliva, and oral cleanliness changed in more than half of them. Ultimately, natural teeth and denture changed in the majority of studied elderly and dental pain changed in the minority of them. This can be explained by that, the inadequate knowledge as well as inadequate practice and limited dentist visiting among the majority of studied elderly, predict the changing in oral health status. These findings go in line with that of Ref. [22] in Edmonton, Canada who found that very few elderly had good oral health, where one fifth had healthy oral cleanliness, more than one tenth had healthy tongues; and around two fifth had healthy gums and tissues.

At the end of this study educational program, there were statistically significant improvements in elderly oral examination findings with some declines were revealed at the follow-up phase. This indicates the effectiveness of the program in leading a positive change in their oral health status. In support of this, the high score of oral examination findings indicate poor oral health status so, the study results demonstrated that the score of oral examination findings had statistically significant negative correlations with elderly oral health knowledge. Similarly, Ref. [23] in Kuopio, Eastern Finland found that oral health

Table 3

Total mean score of Oral health related quality of life domains among the studied elderly (N = 75).

Oral health related quality of life	Pre (n = 75)	Post (n = 75)	Follow up (n = 75)	P ^
<b>Functional limitation:</b>				$< 0.001^{**1}$
Mean ± SD	4.72 ± 1.57	3.71 ± 0.83	4.28 ± 0.76	$< 0.05^{*2}$
Range	2-7	2-5	3-6	$< 0.001^{**3}$
<b>Physical pain:</b>				$< 0.001^{**1}$
Mean ± SD	6.17 ± 1.77	3.83 ± 1.16	4.61 ± 1.38	$< 0.001^{**2}$
Range	2-8	2-6	2-8	$< 0.001^{**3}$
<b>Psychological discomfort:</b>				$< 0.001^{**1}$
Mean ± SD	5.57 ± 1.18	3.61 ± 1.06	4.41 ± 1.23	$< 0.001^{**2}$
Range	4-8	2-6	2-8	$< 0.001^{**3}$
<b>Physical disability:</b>				$< 0.001^{**1}$
Mean ± SD	5.44 ± 1.28	3.55 ± 0.84	4.19 ± 1.01	$< 0.001^{**2}$
Range	2-8	2-5	2-6	$< 0.001^{**3}$
<b>Psychological disability:</b>				$< 0.001^{**1}$
Mean ± SD	4.65 ± 1.75	3.09 ± 1	3.84 ± 0.97	$< 0.001^{**2}$
Range	1-8	1-4	1-5	$0.05 \times 3$
<b>Social disability:</b>				$< 0.001^{**1}$
Mean ± SD	4.83 ± 1.37	3.59 ± 0.77	4.12 ± 0.93	$< 0.01^{*2}$
Range	2-7	2-5	2-6	$< 0.001^{**3}$
<b>Handicap:</b>				$< 0.01 \times 1$
Mean ± SD	3.36 ± 1.78	2.55 ± 1.09	2.56 ± 1.11	$< 0.01^{*2}$
Range	0-6	0-4	0-4	$> 0.05^3$
<b>Total score:</b>				$< 0.001^{**1}$
Mean ± SD	34.75 ± 8.5	23.92 ± 5.03	28.01 ± 5.37	$< 0.001^{**2}$
Range	13-47	11-31	14-35	$< 0.001^{**3}$

^: Paired t-test NS: Non significant \*: Significant \*\*: Highly significant.

P1: Pre versus Post P2: Pre versus Follow up P3: Post versus Follow up.

status improved in both the intervention group during the study, and especially the positive changes in periodontal health can be considered to be clinically substantial.

The findings demonstrated generally poor levels of OHRQoL among these elderly before commencing the program. This was especially noticed in the physical pain domain followed by psychological discomfort domain then, physical disability domain. The findings are expected given the negative impact of these three domains on daily life. In agreement with this, a study in Brazil [24] reported that the highest means were registered for physical pain and psychological discomfort. On the same line, a study in Bengaluru, India found that among the seven domains of OHIP, the greatest impact was on physical pain [25].

At the end of this study program, a statistically significant improvements were shown in all areas of elderly OHRQoL. However, there were some declines at the follow-up phase. This indicates the success of the program, and leads to acceptance of the research hypothesis. On the same line, a study in Korea found a statistically significant improvements in the OHRQoL score between the elderly ( $P < 0.05$ ) [26].

## 5. Conclusion

In the light of the study findings, it can be concluded that, the educational program is effective in improving the elderly's oral health related quality of life. The educational program is also effective in improving elderly's oral health knowledge, oral self-care practices, and oral examination findings. The improvement was correlated to female gender, high level of education and income.

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