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## ORIGINAL PAPER

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# Effect of Oral Health Care Program on Oral Health Status of Elderly People Living in Nursing Homes: a Quasi-experimental Study

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## ABSTRACT

**Background:** Oral health of elderly people plays a major role in their overall health and quality of life, and is an integral part of personal care. **Aim:** The aim of this study was to evaluate the effect of implementing the oral health care program (OHCP) on oral health status of elderly people resident in nursing homes. **Materials and Methods:** This quasi-experimental study was carried out using a pretest-posttest design on 101 elderly people (46 in the intervention group and 55 in the control group) resident in two randomly selected nursing homes in Mashhad, Iran. In the intervention group, the OHCP was carried out by caregivers for 8 weeks. The control group received routine care. Using the oral health assessment tool, the oral health status of elderly people was assessed in both groups at three times; onset of the study, 4<sup>th</sup>, and 8<sup>th</sup> week after the start of the study. **Results:** The oral health status of the elderly people in both groups was not statistically significantly different at baseline, but it changed significantly at the 4<sup>th</sup>, and 8<sup>th</sup> weeks ( $p < .001$ ). **Conclusion:** The implementation of the OHCP for elderly people resident in nursing homes may improve their oral health status after 4 weeks. It is recommended that OHCP be included in care plans of all nursing homes to improve the elderly people's oral health status.

**Keywords:** oral health, aging, elderly, nursing homes.

According to the World Health Organization (WHO), the number of people over the age of 60 was 585 million in 2001 and accounted for 9% of the world population; this rate will double by 2025 (1). In Iran, statistical indicators suggest that the elderly population is increasing annually by 1.25%. The annual growth of the population over 60 years old is estimated to be 2.5% (2).

Although aging is an inevitable physiological process, it increases the possibility of health problems in elderly people, including oro-dental diseases (3). Oro-dental diseases, as a health priority, and the most prevalent unmet health need, have a great impact on a person's quality of life, and are associated with health care costs (4). Oro-dental health affects the physical health of elderly people, as well as their appearance, body image, self-esteem, psychological and social functioning, and ultimately, their quality of life (5, 6). A toothless oral cavity and dentures are major sources of pathogenic microbes, which can cause serious inflammatory or infectious diseases in elderly people. These pathogenic microbes also have negative effects on acute and chronic diseases, and are associated with over 100 systemic diseases with oral manifestations. Also, chronic diseases can affect oro-dental health, as well as the ability of a person to maintain their oro-dental hygiene (7-9). It has been shown that diabetic patients with oral problems have problem with blood sugar control and are more prone to the loss of teeth (10). Also, the risk of developing pneumonia and other respiratory diseases is related to the level of oral hygiene (11).

It has been shown that the oral health status of elderly people is poor, and living in nursing homes may increase the likelihood of oro-dental

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## 1. INTRODUCTION

The increase in the number of elderly people living in developing countries is one of the most important challenges of the twenty-first century.

diseases, as well as the need for oro-dental related evaluation and education (12-13). Since the population of elderly people living in nursing homes is increasing, and their ability to care for themselves may be impaired due to physical and psychological problems, they need support to maintain their oro-dental health. Therefore, providing oro-dental health care by caregivers and nurses is important for elderly people resident in nursing homes (14). However, several studies have suggested that offering oro-dental care to elderly people by healthcare providers have a low priority and also they do not have appropriate level of knowledge about the importance of oro-dental health in elderly people (15, 16). Thus there is a need to implement educational programs for healthcare providers to promote oro-dental health care in elderly people (17). Jablonsky et al. showed that all nursing home employees should take additional training to understand the importance of oro-dental health (18). Gammack et al. showed that, while an oral health education program increased the knowledge of nurses about the oro-dental health of elderly people, it had no effect on the oro-dental health status of elderly people (19). To the best of our knowledge, no study has been done on using an oral health education program to train caregivers and assessing its impact on the oro-dental health status of elderly people in Iran.

## 2. AIM

The aim of present study was to evaluate the effect of an oral health care program (OHCP) on the oro-dental health status of elderly people resident in nursing homes.

## 3. MATERIALS AND METHODS

The present quasi-experimental study was carried out using a pretest-posttest design in 2016 on elderly people resident in nursing homes in Mashhad, Northeast Iran. From a total of 20 nursing homes, 2 nursing homes were randomly selected. Of the 31 caregivers who participated in the study, 25 were female, and 15 were in the intervention group.

Based on the inclusion criteria, 109 elderly people were selected by convenience sampling to participate in the study. In total, 101 elderly people, 46 in the intervention group and 55 in the control group, completed the study. The inclusion criteria for the elderly people were permanent residence in nursing homes, cooperation during oral examinations, short stay (less than three months) in the nursing homes, and having no oro-dental and medical interventions within the last three months and during the study. People who had serious changes in their physical health status, received any medical and dental interventions during the study, or started new medications during the study were to be excluded the study. Five people from the intervention group and three people from the control group were excluded because they expired, they were sent to hospital for an acute physical problem, or they returned to their homes. The demographic questionnaire was administered to the elderly people and caregivers. Also, the caregivers were asked to complete the knowledge questionnaire. Ten experts in oro-dental health provided comments that were used to determine the validity of the questionnaires. The internal consistency reliability of the knowledge questionnaire was in acceptable range (Cronbach's  $\alpha=0.852$ ). The validity of the oral health assessment tool (OHAT)

for the elderly people was confirmed through consultations with dentist supervisors and advisors. Its reliability was evaluated according to data collection by equivalent forms; the Spearman correlation was calculated to be 0.92 between the data from the interobserver reliability (researcher and the colleague), which was statistically significant ( $p=0.001$ ), indicating very reasonable reliability. Demographic information and knowledge questionnaires were completed by the caregivers in both centers to provide baseline measurements (pre-test). Caregivers at the intervention center were invited to participate in a training program, which consisted of four 90 minutes sessions, twice a week, for 2 weeks. At the end of 2 weeks, the knowledge questionnaires were completed again by the caregivers in both centers as a post-test.

The researcher completed the demographic questionnaire and the OHAT for the elderly people before intervention in two groups (pre-test). The OHAT contains sections on the tongue, lips, gums, salivary glands, natural teeth, dentures, oral hygiene, and dental pain. Each section can be scored as 0, 1, or 2; thus, the total score ranges from 0 to 16, where a score of 16 indicates the poorest, and a score of 0 indicates the best oral health status. According to the activities of daily living (ADL) index, the elderly people were divided into three categories: independent, need help, and dependent. The ADL index was completed by the researcher. The researcher reassessed their oral health status using the OHAT in both centers after 4 weeks and 8 weeks of the OHCP being implemented by the caregivers (post-test).

Proper space and facilities were provided for the elderly people who were able to independently carry out their oral care, and only needed reminders or monitoring.

Permission to conduct this study was given by the institution Ethics Committee and informed consent was obtained from the elderly people who participated in the study. Data were analyzed using SPSS software (IBM, Armonk, NY) using repeated measure analysis of variance (ANOVA), independent t-test, and paired t-test.

## 4. RESULTS

The highest percentage of caregivers who participated in the study were women and their mean age was  $37.3 \pm 8.75$  years. The caregivers of the intervention and control groups were homogenous in terms of gender and educational level ( $p > 0.05$ ). There was no significant difference between the two groups of elderly people in terms of gender, educational level, marital status, level of independence, underlying disease, and length of stay in the nursing homes ( $p > 0.05$ ). The mean age of the elderly people in the intervention group was  $77.16 \pm 8.32$  years and  $71.78 \pm 8.163$  years in the control group ( $p=0.001$ ). Although this difference was clinically negligible, age was considered to be a covariate based on repeated measures ANOVA. The results showed that the difference in the ages of elderly people had no significant effect ( $p=0.781$ ).

Table 1 demonstrates that the first knowledge scores of the caregivers in the two groups were not significantly different ( $p=0.243$ ); however, Table 2 shows that there was a significant difference in the knowledge scores between the two groups after the training sessions ( $p<0.001$ ).

Table 3 shows there was a statistically significant difference in the mean pretest oral health score between the two

Pre-test knowledge scores	Number	Mean (SD)
Intervention group	15	8.67 (2.059)
Control group	16	9.25 (2.167)

Table 1. Comparison of the pre-test knowledge scores of caregivers in the intervention and control groups. Mann-Whitney test ( $z = -1.168$ ,  $p = 0.243$ , statistic = 91)

Post-test knowledge scores	Number	Mean (SD)
Intervention group	15	14.33 (1.397)
Control group	16	88.8 (1.962)

Table 2. Comparison of the post-test knowledge scores of caregivers in the intervention and control groups. Mann-Whitney test ( $z = -0.824$ ,  $p < 0.001$ , statistic = 2)

groups ( $p = 0.021$ ). Although the pretest difference was not clinically reliable, based on repeated measures ANOVA, the pretest oral health score was assumed to be control the confounding effect.

Pre-test oral health score	Number	Mean (SD)
Intervention group	51	8 (2.39)
Control group	58	9.21 (2.95)

Table 3. Comparison of the mean pre-test oral health scores of the elderly people in the intervention and control groups. Mann-Whitney test ( $z = -2.30$ ,  $p = 0.021$ , statistic = 1116)

A 2x3 factorial ANOVA with repeated measures was conducted to explore the impact of training of caregivers working in nursing homes on oral health status of elderly residents in the nursing homes. The between-subjects variable was whether or not caregivers were trained; within-subject variable was repeated measures of appraisal time (study onset, end of 4th, and 8th week); and the dependent variable was the oral health status scores of the nursing home residents as measured by the OHAT. An alpha level of .05 was used for statistical significance. Means and standard deviations are shown in Table 4, and a line graph of the results is shown in Figure 1.

Interval	Intervention group			Control group		
	No	Mean (SD)	Standard error	No	Mean (SD)	Standard error
Baseline	51	8.02 (2.472)	0.394	58	9.20 (2.824)	0.360
Fourth week	46	3.09 (2.219)	0.373	55	9.55 (2.761)	0.341
Eighth week	46	2.65 (2.035)	0.360	55	9.65 (2.730)	0.329

Table 4. The mean oral health scores of the elderly people in the intervention and control groups

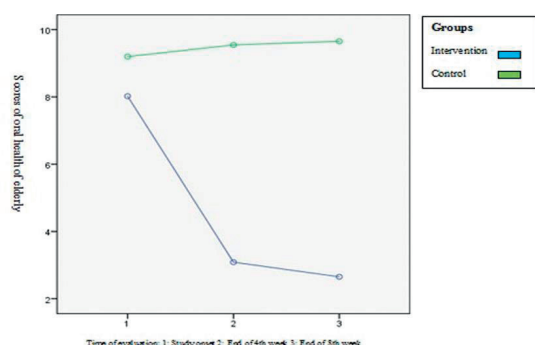


Figure 1. Trend of elderly oral health status score at study onset, end of 4th week and end of 8th weeks in two groups

The assumption of normality was met. However, the Mauchly's test indicated that the assumption of sphericity had been violated, [ $\chi^2(2) = .844$ ,  $p < .001$ ]; therefore the degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ( $\epsilon = .865$ ). There was a main effect for appraisal time of measurement [ $F(1.73, 171.28) = 464.005$ ,  $p < .001$ , partial  $\eta^2 = .824$ ], and a main effect for training of caregivers [ $F(1, 99) = 95.903$ ,  $p < .001$ , partial  $\eta^2 = .492$ ]. There was also a significant interaction between appraisal time and training of caregivers [ $F(1.730, 171.28) = 635.699$ ,  $p < .001$ ]. Therefore, post hoc tests using the Bonferroni correction were conducted to assess the simple effects. Examination of Figure 1 indicates that oral health status of nursing home elderly residents were similar at the study onset, but improved considerably at the end of 4<sup>th</sup>, and 8<sup>th</sup> week, in intervention group, suggesting a positive effect of caregivers' training on the oral health status of nursing home elderly residents. Post hoc Bonferroni pairwise comparison tests ( $\alpha = .005$ ) revealed that the oral health scores were significantly different at the study onset and the end of 4<sup>th</sup> week ( $t = 36.042$ ,  $df = 45$ ,  $p < .001$ ), at the study onset and the end of 8<sup>th</sup> week ( $t = 26.861$ ,  $df = 45$ ,  $p < .001$ ), and at the end of 4<sup>th</sup> and 8<sup>th</sup> week ( $t = 2.817$ ,  $df = 45$ ,  $p = .007$ ), within the intervention group, indicating large effect sizes ( $\eta^2 = .95$ ). In control group, the oral health mean score even increased significantly from the study onset to the end of 4<sup>th</sup> week ( $t = -3.975$ ,  $df = 54$ ,  $p < .001$ ); and to the end of 8<sup>th</sup> week ( $t = -4.550$ ,  $df = 54$ ,  $p < .001$ ); though, such differences were not clinically significant. Mean score difference at the end of 4<sup>th</sup> and 8<sup>th</sup> week were not statistically significant ( $t = -1.352$ ,  $df = 55$ ,  $p = .182$ ,  $\eta^2 = .113$ ).

Moreover, there was a significant difference of oral health mean scores between the elderly residents of the two nursing homes at the study onset ( $t = -2.323$ ,  $df = 107$ ,  $p = .022$ ). Although this difference is indicative of a slightly better oral health status of intervention group, it was not clinically important. Also, oral health status mean scores at the end of 4<sup>th</sup> ( $t = -12.781$ ,  $df = 99$ ,  $p < .001$ ,  $\eta^2 = .623$ ), and 8<sup>th</sup> ( $t = -14.370$ ,  $df = 99$ ,  $p < .001$ ,  $\eta^2 = .676$ ) week were significantly different. This shows a substantial incremental improvement in oral health status of elderly residents only 4 weeks after training their caregivers, in the intervention group. This general pattern of differences among oral health scores of elderly people suggests that training of their caregivers may indirectly improve their oral health status, but not before 4 weeks (Table 5).

Factors	Sum of squares	df	Mean squares	F	p-value	Effect size
Time	378.460	1.730	218.751	464.005	0.000	0.824
Time and group	518.499	1.730	299.695	635.699	0.000	0.865
Error	80.748	171.279	0.471			

Table 5. Repeated measures analysis of variance

## 5. DISCUSSION

The results of this study indicated that the OHCP significantly improved the oral health status of the elderly people living in nursing home. Based on the knowledge questionnaire, the mean knowledge score of the caregivers in the intervention group after two weeks of training sessions increased as compared with control group. Also, the oral health status of the elderly people in the intervention group has been significantly improved. The findings of the present study are in

line with the results of the studies reported by McKeown et al. (20), Le et al. (21), Kim et al. (22), and De Visschere et al. (23).

Le et al. carried out a study on residents in nursing homes. The caregivers were educated about oral care using a 40-minute video, which was a shorter training session than provided in our study. The results showed that the plaque index (PI) and the knowledge of the caregivers improved from the beginning of the oral health education program to 6 months after the intervention (21), which agreed with the results of our study. Visschere et al. evaluated the implementation of an oral hygiene protocol over 5 years. In their study, a one-hour session training was given to caregivers to explain the principles of intervention, and to provide theoretical and practical education about oral hygiene. This time length of single training session was obviously shorter than the training sessions in our study. They found that the dependence level was correlated with the dental plaque score, which is consistent with our results. Also, it has been shown that 2 years after implementation of the OHCP in the nursing home, the dental plaque score reached its lowest value and the oral health status of the elderly people improved (23). These results were consistent with our findings. The reason for the agreement of the results of the two studies is related to the oral hygiene protocol and the education given to the caregivers.

Kim et al. examined the effect of an OHCP for stroke patients in an intensive care unit. The OHCP was conducted for 2 weeks. The OHAT was employed to assess the impact of the OHCP on the oral health status of the elderly people. The results showed that the PI and the gingival index (GI) were much lower in the intervention group than in the control group (22), which was similar to our results. One possible reason for this similarity is the implementation of the OHCP, which is a coherent and systematic program. Simon et al. assessed an oral health training program for the caregivers of elderly people in residential homes. The results showed no changes in the status of oral hygiene and the PI, 6 months after the intervention, which was inconsistent with the results of our study (24). This difference between studies may be due to the absence of trained caregivers during the 6 months in the same nursing home, the insufficient time given to provide oral care by the caregivers, and the lack of adequate facilities to provide optimal care. Overall, despite the differences in the duration and types of training in the various studies, the majority of studies showed that training the caregivers improved the oral health of elderly people with varying degrees of dependency living in nursing homes.

Some of the limitations of the present study were caregivers who were unwilling to participate in the training courses, failure of the managers of the nursing homes to provide a suitable place for training the caregivers, and failure by the caregivers to follow the instructions correctly.

## 6. CONCLUSION

Training the caregivers and subsequently implementation of the OHCP by caregivers for 8 weeks significantly improved the oral health status of the elderly people. It is recommended that OHCP be implemented in all nursing homes to improve the oral health status of elderly people.

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## REFERENCES:

1. Ng TP, Niti M, Chiam PC, Kua EH. Prevalence and correlates of functional disability in multiethnic elderly Singaporeans. *J Am Geriatr Soc.* 2006; 54(1): 21-9.
2. Afshar PF, Asgari P, Shiri M, Bahramnezhad F. A Review of the Iran's elderly status according to the census records. *Galen Medical Journal.* 2016; 5(1): 1-6.
3. Griffin SO, Jones JA, Brunson D, Griffin PM, Bailey WD. Burden of oral disease among older adults and implications for public health priorities. *Am J Public Health.* 2012; 102(3): 411-8.
4. Saub R, Locker D. The impact of oral conditions on the quality of life of the Malaysian adult population: preliminary results. *Med J Malaysia.* 2006; 61(4): 438-36.
5. Razak PA, Richard KM, Thankachan RP, Hafiz KA, Kumar KN, Sameer KM. Geriatric oral health: a review article. *J Int Oral Health.* 2014; 6(6): 110-6.
6. Gomes AS, Abegg C, Fachel JMG. Relationship between oral clinical conditions and daily performances. *Braz Oral Res.* 2009; 23(1): 76-81.
7. Tsakos G, Marcenes W, Sheiham A. The relationship between clinical dental status and oral impacts in an elderly population. *Oral Health Prev Dent.* 2004; 2(3): 211-20.
8. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bull World Health Organ.* 2005; 83(9): 661-9.
9. Holmlund A, Holm G, Lind L. Severity of periodontal disease and number of remaining teeth are related to the prevalence of myocardial infarction and hypertension in a study based on 4,254 subjects. *J Periodontol.* 2006; 77(7): 1173-8.
10. Bharateesh J, Ahmed M, Kokila G. Diabetes and Oral Health: A Case-control Study. *Int J Prev Med.* 2012; 3(11): 806-9.
11. Tada A, Miura H. Prevention of aspiration pneumonia (AP) with oral care. *Arch Gerontol Geriatr.* 2012; 55(1): 16-21.
12. Lamster IB. Oral health care services for older adults: a looming crisis. *Am J Public Health.* 2004; 94(5): 699-702.
13. Aghili H, Ahadian H, Baghiani M. Dental health and treatment needs of elderly home residents and nonresidents in Yazd city. *J Health Res.* 2010; 6(1): 116-22.
14. Petersen PE, Yamamoto T. Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol.* 2005; 33(2): 81-92.
15. Nakre PD, Harikiran A. Effectiveness of oral health education programs: A systematic review. *J Int Soc Prev Community Dent.* 2013; 3(2): 103-15.



16. Albrecht M, Kupfer R, Reissmann DR, Mühlhauser I, Köpke S. Oral health educational interventions for nursing home staff and residents. *Cochrane Database Syst Rev*. 2016; 9: CD010535.
17. Reigle JA, Holm K. Knowledge of oral health of nursing staff caring for disadvantaged older people. *J Nurs Educ Pract*. 2015; 6(1): 31-38.
18. Jablonski RA, Munro CL, Grap MJ, Schubert CM, Ligon M, Spiegelmyer P. Mouth care in nursing homes: knowledge, beliefs, and practices of nursing assistants. *Geriatr Nurs*. 2009; 30(2): 99-107.
19. Gammack JK, Pulisetty S. Nursing education and improvement in oral care delivery in long-term care. *J Am Med Dir Assoc*. 2009; 10(9): 658-61.
20. McKeown L, Woodbeck H, Lloyd M. A journey to improve oral care with best practices in long-term care. *Can J Den Hyg*. 2014; 48(2): 57-62.
21. Le P, Dempster L, Limeback H, Locker D. Improving residents' oral health through staff education in nursing homes. *Spec Care Dentist*. 2012; 32(6): 242-50.
22. Kim EK, Jang SH, Choi YH, Lee KS, Kim YJ, Kim SH, et al. Effect of an oral hygienic care program for stroke patients in the intensive care unit. *Yonsei Med J*. 2014; 55(1): 240-6.
23. De Visschere L, Schols J, van der Putten GJ, de Baat C, Vanobbergen J. Effect evaluation of a supervised versus non supervised implementation of an oral health care guideline in nursing homes: a cluster randomised controlled clinical trial. *Gerodontology*. 2012; 29(2): e96-106.
24. Simons D, Baker P, Jones B, Kidd EA, Beighton D. An evaluation of an oral health training programme for carers of the elderly in residential homes. *Br Dent J*. 2000; 188(4): 206-10

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