Health Education Program for Elderly with Oral and Dental Problems about Oral Health at Assiut City. Egypt.

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Abstract: *Oral health is an integral part of general health. In the elderly population poor oral health has been considered a risk factor for general health problems.*
The study aimed to:*Improving elderly knowledge, and practice about oral and dentalcare.*
Subjects and method: *A quasi-experimental research design was utilized.This study was conducted in dental out-patients clinics of El-eman and El-shamla hospitals.at Assiut city, Egypt. The total number of sample was 130 elderly.****Tools:*** *Three tools were used.*
ToolI: *structured interview questionnaire. It includes socio-demographic characteristics and question related to knowledge& reported practice),*
ToolII*: reported practice about general oral health care.*
ToolIII*: brief oral health status examination scale (BOHSE).*
Results:*The study showed that all the studied elderly had unsatisfactory knowledge in pretest which was improved to (96.9%) had satisfactory knowledge in posttest. In addition only (4.6%) of the studied elderly had adequate reported practice about tooth brushing in pretest, which were improved to (95.4%) in posttest.*
Conclusion*: the total and the most of the studied elderly had unsatisfactory knowledge and inadequate reported practice in pretest respectively. Which were improved among the vast majority in posttest.*
Recommendations: *Providing health education programin the dental outpatient clinics about oral health to improve knowledge and practice of the elderly people.*
Key words*: Elderly, Oral Health, Knowledge, Reported Practice.*

I. Introduction

According to the WHO, the global population is increasing at the annual rate of 1.7%, while the population of those over 65 years is increasing at a rate of 2.5%. Globally**,** the population is ageing rapidly. From 2015 to 2050, the world's population proportion over sixty years will double nearly, from 12% to 22% **(WHO, 2016)**. By 2050, global life expectancy at birth is projected to increase by almost eight years, climbing from 68.6 years in 2015 to 76.2 years in 2050**(National Institute of Aging, 2016).**

The **Central Agency for Public Mobilization and Statistics in Egypt, (2016**), has reported that older people in 2016 was around 8.9%, while the expected percentage will be 10.9% in 2026. The life expectancy for male elders expected to be 19.3 years in 2026.

The Canadian Dental Association also defines oral health as a state of the mouth andrelated 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 **(Abd-allah et al., 2018)**

The most important oral health problems that have been recorded in dental literature for older population include tooth loss, dental caries, periodontal diseases, xerostomia (dry mouth) and oral cancer. Edentulism (tooth loss) influences social life, either causing aesthetic problems or affecting functional abilities, such as speaking, chewing and eating. Dental caries in older people is similar to that in people in their thirties. In addition, the accumulation of several risk factors, such as plaque or systemic diseases, acts synergistically in the onset of periodontal disease in seniors **(Georrgios, 2015).**

Oral health affects the elderly with regards to diet and nutrition intake, psychosocial interaction, and general well-being as the oral cavity is a portal of entry for microbial infections (**Pandy et al., 2014)**. Although oral diseases are rarely life and death situations, they are among the most common chronic diseases worldwide.

Furthermore, decreased oral health status can also affect personal appearance, self-image and, therefore, reduces life satisfaction and quality of life (**Mariño et al., 2013**).

In the elderly population poor oral health has been considered a risk factor for general health problems. Older adults are more susceptible to oral conditions or diseases due to an increase in chronic conditions and physical/ mental disabilities. Globally; poor oral health amongst older people has been particularly evident .The negative impact of poor oral conditions on the quality of life of older adults is an important public health issue (**pandy et al., 2014**).Oral health is currently held to be strictly related to social, cultural and educational background and in the particular case of elderly patients due to decrease the ability to seek dental/oral medical services (**Guiglia, et al., 2010**).

Oral health plays a pivotal role in general health, especially in older people. Oral diseases may also affect the onset of systemic conditions such as diabetes mellitus, cardiovascular disease, stroke and hypertension. On the other hand, there is abundant evidence supporting the idea that the improvement of oral health results in controlling systemic diseases such as diabetes mellitus. Periodontal disease is characterized as a multi-factorial inflammatory disease, which may share the same risk factors with various systemic diseases. Not only periodontal disease, but also dental caries and oral cancer, may exhibit an interplay role. In addition, the process of growing old increases the risk of chronic conditions that may influence the prevalence of oral conditions in older people (**Georgios, 2015**).

Appropriate oral care for some patients is completely dependent on the nursing staff, which is dependent on their oral health knowledge. For independent patients, oral health promotion and teaching to improve the knowledge of older people will improve their attitudes, oral self-care, and health (**Reigle and Holm, 2016**).

Significance of the study:
There are profound and consequential oral health disparities within the population in Egypt. There is a distinct lack of policy on prevention in oral health in Egypt, in addition to a lack of research, data, or planning provisions for dental treatment (**WHO, 2015**).

Mohsen et al., (2017) showed that 61.3% of the studied elderly had dental loss as dental disease, 50% had gum inflammation, 43.3 % had broken teeth, 34.7% had dental caries and 21.3% have discoloration of teeth in Benha city in Egypt.

The prevalence of oral and dental diseases among older people at Assiut city is also too high, it was found that 88.4% of the elderly had one or more oral complains as; 77.6% had dental pain, 70.8% had oral dryness, 45.4% had gum bleeding, 39.8% had swallowing/ chewing problems, and 19.2% had hot or cold dental sensitivity (**Moktar, 2010**).

As a result of increase the oral and dental problems among elderly because of oral health neglicance and lack of effective dental care services at acceptable price in Egypt. So the present study has been conducted.

Aim of the study
- Improving elderly knowledge, and practice about oral and dentalcare.

Hypotheses:-
1- Lack of elderly's knowledge and practice about oral and dental problems and oral health care procedures.
2- Improvement in elderly's knowledge and practice about oral and dental problems and oral health care procedures will be expected after implementing the program.
3- Minimizing the recurrence of oral and dental problems and complications will be expected.

II. Subjects and Method
Research design: Quasi-experimental research design was used.
Study Setting: - The study carried out in Ministry of Health hospitals at Assiut city (the dental out-patient clinics of the General Assiut Hospital& the General El-Eman Hospital at Assiut city, Egypt.
Sample:-
- The selected elderly were patients with oral and dental problems (130 elderly patients) chosen by using purposive sample for the application of educational program.

Tools for Collecting Data:-This study includes three tools.
Tool I: - Interview questionnaire form to assess elderly's knowledge and reported practice. It includes three parts:-
(Part 1): It includes demographic data as age, sex, resident, marital status, level of education, and occupation.
(Part 2):– It includes:

1. Assessment of elderly oral health knowledge. It include 20 questions: knowledge about oral problems (3 questions), knowledge about oral diseases (tooth decay and dry mouth) (4 questions), knowledge about oral diseases (gum diseases and halitosis) (5 questions), knowledge about oral health care procedures (tooth brushing, flossing, denture care) (4 questions), knowledge about maintaining oral health (4 questions). **Scoring system**: The participant elderly were classified into a group with satisfied knowledge (score ≥ 60%) and group and unsatisfiedknowledge = score <60%) **(Mohsen et al., 2017).**
2. Assessment of elderly reported practice about tooth brushing and flossing. It includes 9 items, **Scoring system**: the participant elderly were classified into a group with (adequate practice = score ≥ 60% and inadequate practice = score <60%) **(Mohsen et al., 2017).**

Tool II:-

To assess reported practice about general oral health care among elderly. It include **WHO oral health questionnaire, 2013**. It contain 6 questions. (times of cleaning teeth, method of cleaning teeth, the last dentist visit, the reason for this visits, problems that results from your mouth state and diet habits and eating of different nutrient). **Scoring system**: all questionnaire questions were summed-up and converted into percent score. Then classified into 3 groups (poor care = <50%, fair care =score 50-70%, and good care= score >70%) **(Alhoufy, 2007).**

Tool III:-

The original scale was constructed by *The Kayser- Jones (2005) Brief Oral Health Status Examination (BOHSE)*. It used to assess the oral health status examination of elderly. It includes eight items that assess lips, tongue, tissue and gums, saliva, condition of natural teeth, denture (artificial teeth), oral cleanliness and dental pain. Scoring system of *Kayser- Jones scale* ranging from *(0, 1, 2)* were respectively given to the responses of (healthy, changes and unhealthy). The scores classified into (healthy mouth from 0 : <8) (unhealthy 8 : 16).

Validity and Reliability of study tools*:

Tools tested for its content validity by group of five experts in community and gerontological health nursing. The required modification was done. The reliability was tested by Cronbach's Alpha test to be (0.990) while the validity was (0.995) that demonstrating acceptable result.

III. Method

I- Administrative design:

An official letter approval was obtained from the Dean of Faculty of Nursing at Assiut University to the director of the General Assiut Hospital& the General El-Eman Hospitalto obtain the necessary approval to conduct the study. This letter included a permission to collect the necessary data and explain the purpose and nature of the study.

II- Pilot study:

Before performing the main study, a pilot study was carried out on 10% patients attended to dental out-patient clinics to test the clarity of the questionnaire and to do the necessary modification. Also to estimate the time needed. Those who shared in the pilot study were not included in the study sample.

III- Ethical Consideration:

Research proposal was approved from ethical committee in the faculty of nursing. At Assiut University, Egypt.There was no risk for study subject during application of the research. The study was following ethical principles in clinical research. Confidentiality and anonymity was assured. Participants had the right to refuse to participate and or withdraw from the study without any rational any time.

IV- Field work:

The researchers met the elderly, explained the purpose of the study, and asked for participation. They started a face to face individual interview with elderly, completed the sheets for all persons. The study started from beginning of September 2016 to the end of August 2017. The assessment was done on all study sample (130) elderly participants; then the educational program was implemented.

The data was collected 3 days/ week.The average time spent during filling of sheet (pretest) and giving the educational program was around 80-90 minutes according to respond of patient. The average number of elderly which interviewed and given health education program was one elderly patient per day.

Description of HealthEducationProgram.

Based on review of the current local and international literature about oral and dental health using books, web sites, articles, and magazine, the researcher prepared the program (educational booklet) and brochure which include a summarized simple information about oral and dentalproblems among elderly, risk factors and causes, oral health care procedures..ect, Both educational booklet and brochure was given to every study participant (130 elderly)

1. **Content ofthe Health Education Program**: The program was including 2 parts:-

A. **Theoretical part:**

It includesknowledge about oral problems, knowledge about tooth decay and dry mouth, knowledge about oral diseases gum diseases and halitosis, knowledge about oral health care procedures (tooth brushing, flossing, denture care), knowledge about maintaining oral health.

B. **Practical part:**

It includes teaching elderly tooth brushing, tooth flossing and denture care.

General objectives of the health education program.
▪   Improving knowledge and practices among elderly about oral and dental care.

Specific objectives:
▪   To assess elderly knowledge about oral and dental problems.
▪   To assess elderly oral care reported practices.
▪   To plan health education program about oral health care among elderly.
▪   To implement health education program about oral health among elderly.
▪   To evaluate health education program about oral health among elderly.

The program phases

A. Assessment phase:

At initial interview the researcher introduced herself to elderly to initiate line of communication, explain the nature and purpose of educational program, then filled out the questionnaire sheets before implementation the program to assess knowledge, reported practice and needs of elderly.

B. Planning phase:

The arrangement of conducting the program was done during this phase. The sessions and time of the program were decided. The educational program was given to one elderly per day. Other facilities were checked and arranged during this phase as teaching place, audiovisual aids and handout.

Teaching time: the time of teaching was decided according to the elderly time and coordination between the researcher and each elderly patient individually, the researcher attends three days/ week, about 90-120 min every day according to the respond of patients.

Teaching place: The study program was conducted in the waiting area of dental outpatient clinics of the General Assiut Hospital & the General El-Eman Hospital.

Teaching methods and materials: it was prepared before implementing the educational program, to prepare simple teaching instruments and audiovisual aids to be used; as lecture, discussion, brainstorming, picture, handout and used media, as poster, picture, labtop, video, colored handouts, colored brochures.

C. Implementation phase:

The educational program was conducted in twelve months (from September 2016 to the end of Augst 2017). Total number of elderly participated in the program was 130 (one elderly per day). Filling the pretest sheet and giving health education program in the waiting area of dental clinics before entering to the physician in 3 sessions. Before beginning of the first session, an orientation to the program and its purpose was done and each elderly patient informed about time of sessions (taken 90-120 minutes).

Then provide health education to elderly patient in three sessions. 1st session was about overview of oral health (age changes, common problems, causes & risk factors, signs & symptoms) and it last for 30 minutes, 2nd session was about oral health care procedures (tooth brushing, flossing and denture care by explaining procedures, watching video and redemonstrating), it last for 30 minutes and 3rd session was about maintaining oral health (appropriate diet, benefits of maintaining elderly oral health and the ten American Dental Association recommendation), it last for 30 minutes.

Finally, the post test for patient's knowledge and reported practice was implemented immediately by repeating the same format of the pretest (only the second part of the first tool (knowledge and reported practice) to determine the effect of the implemented program.

D. Evaluation phase:
After implementing the educational program for elderly patients, reassessment has done by posttest which done immediately after implementing and completing the program to assess participant's knowledge and reported practice.

V- Statistical analysis:
The data obtained were reviewed, prepared for computer entry, coded, analyzed and tabulated. Descriptive statistics (I.e., percentages, mean and standard deviation) were done using computer program SPSS version20, Excel 2010.

Chi-square, and t-test used to compare categorical variables and differences in the distribution of frequencies among different groups. It was considered significant when P-value were less than 0.05. The researcher use Phi and Cramer's V for nominal data, if chi square cannot use

IV. Result

Table (1): Distribution of the studied elderly of study group before the program according to their some socio-demographic characteristics at Assiut city, 2017.   N=130

Some socio-demographic data	N=130	
	No.	%
Age		
Range	60 – 80	
Mean ± SD	67.98 ± 4.69	
Gender		
Male	70	53.8
Female	60	46.2
Residence		
Rural	94	72.3
Urban	36	27.7
Marital status		
Married	88	67.7
Divorced	3	2.3
Widowed	37	28.5
Single	2	1.5
Education level		
Non Educated	113	86.9
Educated	17	13.1
Occupation		
Worked	15	11.6
Not working	115	88.4

Table (2): Distribution of the studied elderly according to their reported practice in pre and posttests as their orders at Assiut City, 2017.   N=130

Reported practice about tooth brushing	Pre				Post				X^2	P. value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
• Using tooth brush with 45 degree toward gum	35	26.9	95	73.1	130	100.0	0	0.0	Phi= 146.56	<0.001**
• Moving tooth brush front and back gently	38	29.2	92	70.8	130	100.0	0	0.0	Phi= 139.30	<0.001**
• Washing the outer, inner, biting surfaces with tooth brush	20	15.4	110	84.6	130	100.0	0	0.0	Phi= 187.22	<0.001**
• Cleaning the internal surfaces by bending the brush vertically and move up and down	6	4.6	124	95.4	122	93.8	8	6.2	203.51	<0.001**
• Cleaning tongue to remove bacteria	3	2.3	127	97.7	129	99.2	1	0.8	240.44	<0.001**
• Brushing teeth twice pre day	15	11.5	115	88.5	114	87.7	16	12.3	147.76	<0.001**

• Flossing teeth to remove debris between teeth daily	5	3.8	125	96.2	106	81.5	24	18.5	157.20	<0.001**
• Using mouth wash or moth rinse	24	18.5	106	81.5	98	75.4	32	24.6	82.30	<0.001**
• Using toothpaste contain fluoride twice per day	130	100.0	0	0.0	98	75.4	32	24.6	Phi= 34.25	<0.001**

(*) there is statistical significant difference
(**) there is highly statistical significant difference.
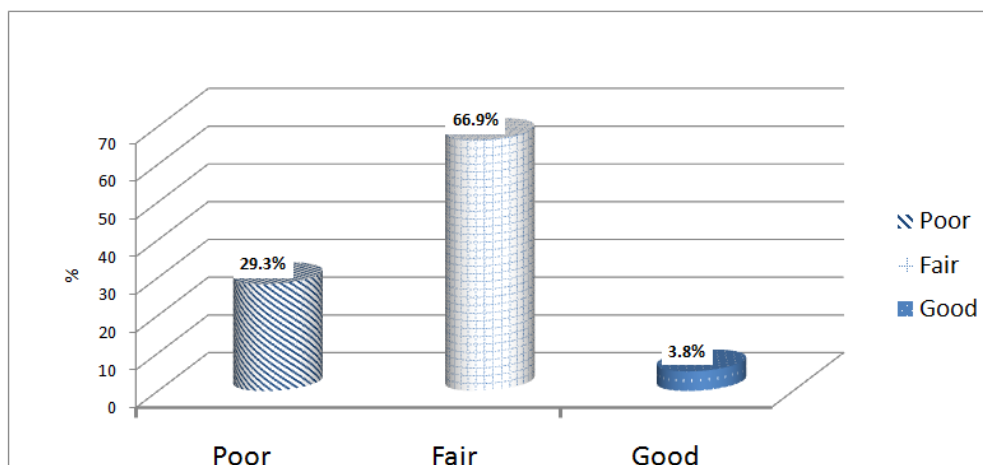
Figure (1): Distribution of the studied elderly according to their total score of knowledge in pre and posttests at Assiut city, 2017.   N=130.
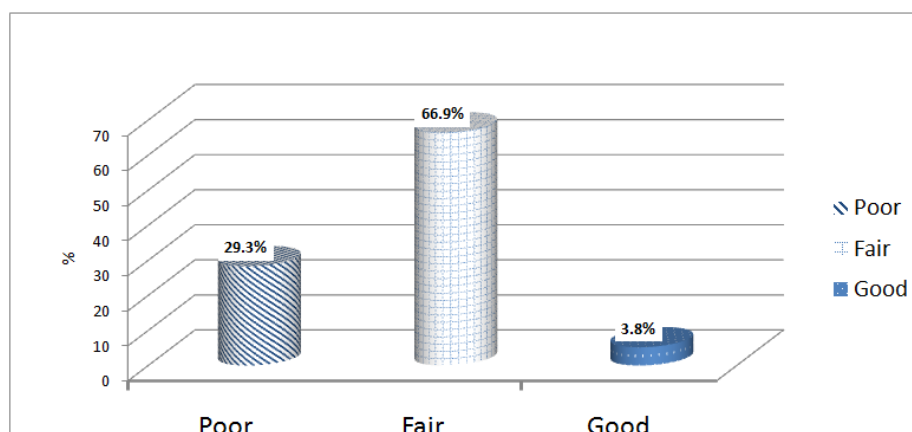

Figure (2): Distribution of the studied elderly according to their total score of reported practice about general oral health care at Assiut city, 2017.   N=130
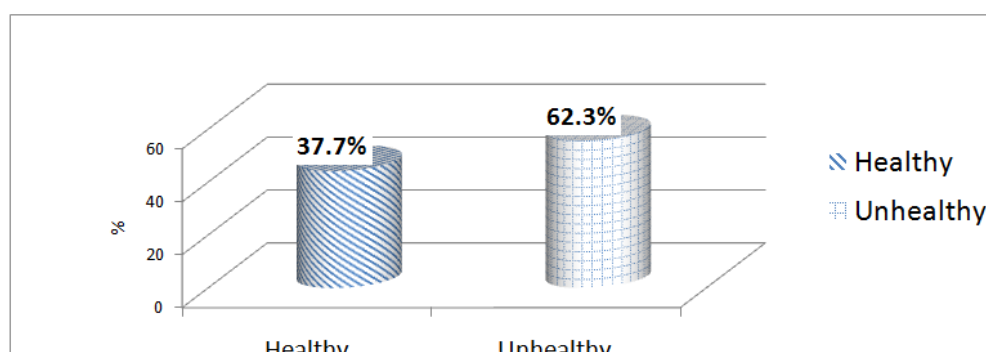

Figure (3): Distribution of the studied elderly according to total score of brief oral health status examination at Assiut city, 2017.   N=130.

Table (3): The relation between the studied elderly's total score of knowledge (pre and posttests), total score of reported practice about tooth brushing and oral health status examination of elderly at Assiut city, 2017.   N=130

Variable	Total score of knowledge						P. value
	Pretest		Posttest				
	Unsatisfactory		Satisfactory		Unsatisfactory		
	No.	%	No.	%	No.	%	
Reported practice about tooth brushing							
Adequate	6	4.6	120	95.2	2	50.0	<0.001**
Inadequate	124	95.4	6	4.8	2	50.0	
Oral health status							
Healthy	49	37.7	51	40.5	4	100.0	0.018*
Unhealthy	81	62.3	75	59.5	0	0.0	

(*) there is statistical significant difference
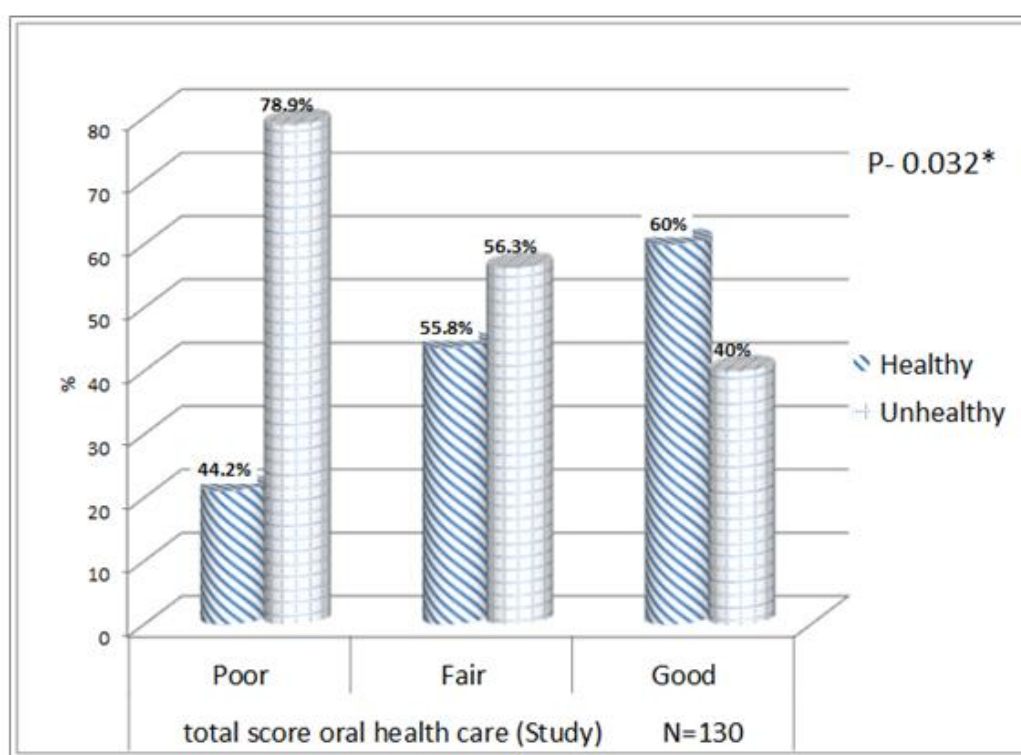(**) there is highly statistical significant difference.

Figure (4): relation between the studied elderly total score of reported practice about general oral health care and oral health status examination of elderly at Assiut city, 2017.   N=130

Table (1): cleared that the mean age of the studied elderly was 67.98 + 4.69 and (53.8%) of the studied sample were male. (72.3%) of the studied elderly were from rural areas and (67.7%) of them were married.
Table (2): all items of reported practice about tooth brushing improved in posttest. There were highly statistical significance difference between all items of reported practice between pre and posttest of study group P= (<0.001)
Figure (1): showsthat no one of the studied elderly have satisfactory knowledge in pretest which were improved to (96.9%) in posttest.
Figure (2): presents that 66.9% of elderly have fair reported practice about general oral health care and 29.3% of elderly have poor reported practice about general oral health care.
Figure (3): reveals that 62.3% of the studied elderly had unhealthy oral state. While 37.7% had healthy oral state
Table (3):showed that there was statistical significant difference between total score of knowledge and (total score of reported practice about tooth brushing and oral health status examination of elderly) P< (0.001, 0.018) respectively.

Figure (4): illustrates that there was statistical significant difference between the studied elderly total score of reported practice about general oral health care and total score of brief oral health status examination P<0.032.

V. Discussion

The mouth reflects a person's health and wellbeing throughout life. Oral disease had an impact on many aspects of general health and health conditions\diseases can intern had an impact on oral health. Good oral health is an essential part of daily living. Poor oral health is closely linked to economic deprivation, social exclusion and cultural difference. Emerging evidence has showed a strong link between the effects of oral disease and general health. The mouth is the gateway to the rest of the body. Oral disease is associated with systemic disease as cardiovascular disease, stroke, respiratory infections, diabetes and nutritional problems**(Mohsen et al., 2017)**

Regarding gender, the results of the current study showed that the more than half of participant elderly were males; while more than two fifth were females. As male are more able for movement and transport especially from rural areas. The results are in agreement with **Agrawal et al., (2015**) who mentioned that more than two fifth were females. On the other hand, the results of the present study are inconsistent with **Hernández-Palacios , et al., (2015) and Alves et al., (2016)** who mentioned that more than two third of the participant elderly were females respectively.

As regard residence, the results of the present study revealed that less than three quarters of the studied elderly were from rural areas. This may be because of our setting were ministry of health hospitals which serve the surrounding rural areas at acceptable price comparing to the private dental clinics. This result agrees with **Mohsen et al., (2017)** who found that slightly less than two third of the participant elderly were from rural areas. On the other hand the results are confronted with **Alves et al., (2016)** who found that more than half of the participant elderly were from urban areas.

According the level of education, the results of the current study revealed that the majority of the studied elderly were not educated and more than one tenth of them were educated. These results are supported by **Samnieng et al., (2013)**who reported that the majority of the studied elderly hadn't attended school. In addition, it agrees with **Rodrigueset al., (2017)** who found that slightly less than three quarters of the studied elderly had never studied.In contrast, these results disagree with **El Helou, et al., (2014)** who reported that about one third of the participant elderly had achieved an elementary level of education. This result also confronted with **Porter et al., (2015)** who stated that more than one third of the studied elderly completed primary school, and secondary school and more than one quarter finished university.

As regard total score of knowledge, the results of the current study showed that one hundred percent of the studied elderly had unsatisfactory knowledge in pretest. This may be due to high level of illiteracy and lack of oral health education for elderly, while after implementation of education program for study group the vast majority of the studied elderly had satisfactory knowledge. These reveals that implementation of educational program had good impact on their knowledge and improved it. Thus, there was statistical significant difference between total score of knowledge in pre and posttests.

These findings of the current study agree with **Bashiru et al., (2017)** who reported that near two third of the studied elderly had poor oral health knowledge and more than one third had good oral health knowledge. These results are also confronted with **Chowdary et al., (2015)** who stated that more than half of the studied elderly had low oral health literacy levels and almost one fifth of them had high oral health literacy levels.The results of the present study are also supported by **Abd-allah et al., (2018)** who reported that there were statistically significant improvements in elderly's knowledge, which indicates the effectiveness of the program in leading a positive change in their knowledge.

Regarding the total score of elderly reported practice about tooth brushing and flossing, the results of the present study showed that the majority of the studied elderly had inadequate reported practice. This may be attributed to lack of elderly knowledge about the right technique of oral health care procedures (tooth brushing & flossing) and lack of regular using of these procedures among elderly, while after implementing health educational program for study group, it was found that the vast majority of the studied elderly had adequate reported practice about tooth brushing related to health educational program was successful in improving reported practice about tooth brushing among the studied elderly by demonstrating tooth brushing and flossing using pictures, videos, and asking elderly for redomenstrating. Thus, there was a statistical significant difference between total score of reported practices about tooth brushing in pre and posttests.

These results of the current study are consistent with **Samnieng et al., (2013) and Al-Sharbatti and Sadek, (2014)** who reported that more than two thirds and more than three quarters of the studied elderly had low oral health practice, while less than one third and more than one tenth had high oral health practice respectively. Moreover, these results of the current study disagree with **Al-Sinaidi., (2012)** who reported that slightly less than two third of the studied elderly practiced oral hygiene and most of them did not need the help of a professional caregiver. These results of the present study are also supported by **Abd-allah et al., (2018)**

who reported that there were statistically significant improvements in elderly's oral self-care practices, which indicates the effectiveness of the program in leading a positive change in their practices.

Concerning the total score of reported practice about general oral health care, the results of the present study showed that about two third of the studied elderly had fair reported practice about general oral health care and more than one quarter of them had poor reported practice about general oral health care, while only less than one tenth of them had good reported practice about general oral health care. This may be attributed to lack of interest and neglect of oral health among elderly and the oral health promotion is not practiced in Egypt as most patients visit the dental clinic only when they had pain or an emergency dental problem.

The results of the current study are consistent with **Michele et al., (2015)** who stated that less than two fifth, less one third and less than one third of the studied elderly had poor, fair and good oral hygiene status respectively.

Regarding the total score of oral health status examination, the results of the present study showed that more than half of the studied elderly had unhealthy oral state and more than two fifth of them had healthy oral state. This may be attributed to the neglect of tooth brushing, tooth flossing and routine dental checkup among elderly. These results are consistent with **Hernández-Palacios et al., (2015)** who stated that more than half of the participant elderly had poor self-perceived oral state, while about more than one quarter and almost one tenth of them had normal and good self-perceived oral state.

As regard the relation between the studied elderly's total score of reported practice about general oral health care and total score of oral health status examination, the results of the present study showed that more than three quarters of the studied elderly who had unhealthy oral state had poor reported practice about general oral health care. Statistical significant difference were found between the studied elderly's total score oral health care and oral health status. This may be attributed to that good or fair oral health care can achieve healthy oral state.

VI. Conclusion

Based on the results of the present study**.** It could be concluded thatthe total of the studied elderly had unsatisfactory knowledge about oral and dental problems and oral health care in pretest, while after implementation of the educational program their knowledge were improved among the vast majority of elderly.

The most of the studied elderly had inadequate reported practice about tooth brushing in pretest, while after implementation the educational program their reported practices were improved among the vast majority of elderly.

VII.   Recommendations

Based on the results of the present study, the following recommendations were suggested**:**
1. Providing routine dental checkup for elderly in all health care facilities.
2. Providing health education program in the dental outpatient clinics about oral health to improve knowledge and practice of the elderly people.
3. Adding oral health course in educational curriculum of nursing institutes and faculties to increase awareness of oral health among the nursing staff which will reflect on society.

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