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ORAL HEALTH AND SWALLOWING PROBLEMS AMONG ELDERLY PEOPLE AT MENOFIA GOVERNORATE

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Abstract

Background: Population aging is a great challenge for the health care systems in Egypt and oral health is complex and multifaceted, oral diseases are age related, it affects elderly systemic health. **Aim:** To assess oral health and swallowing problems among elderly people at Menofia Governorate. **Design:** A descriptive exploratory research design was used. **Sample:** Purposive sample include 300 elderly. **Setting:** The present study was done in El-Ramad hospital and Menofia University hospital at Shibin El-Kom, Menofia Governorate. **Tools:** Two tools were used for data collection: I) A structured interview questionnaire include 4 parts (Demographic characteristics, Elderly history, World Health Organization Oral Health Interview Questionnaire for adult, Swallowing Disturbance Questionnaire). II) Oral Health Assessment Tool for Non-Dental Professionals. **Results:** The study showed that, in relation to oral health status 47.6% of elderly people have ≥ 20 natural teeth, during the past 12 months 51.7% of them were suffering from teeth or mouth pain or discomfort, 59.0% of the elderly people had minor swallowing problems, 34.3% of them had moderate swallowing problems, while, 6.7% of them had severe swallowing problems, 86.3% of studied elderly had healthy oral health status, while only 5.7% had unhealthy oral health status. **Conclusion:** Significant relation between elderly people demographic characteristics and their oral health as in educational level, marital status and monthly income, also their swallowing problems and demographic characteristics as in gender, education, occupation and marital status except in age, living with and income. **Recommendation:** An Educational Program on Oral Health and Swallowing problems among Elderly People on large sector and other settings.

Keywords: Elderly people, oral health, swallowing problems.

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INTRODUCTION

Population ageing is a global phenomenon. Virtually every country is experiencing growth in the size and proportion of older persons in their population. There were 727 million persons aged 65 years or over in the world in 2020. The number of elderly is projected to double to 1.5 billion in 2050. In Egypt, 81.52% of homebased elderly people are complaining from one dental problem while the rest 18.42% of them suffered from more than one dental problem. These disorders have a significant burden on the elderly (1, 2).

Oral health is an integral part of general health, so good oral health is important for elderly people's well-being and is essential for healthy ageing. However, with increasing age, declining health, and dependence on care, elderly people are more likely to develop poor oral health. Oral health is a fundamental component of physical and mental well-being, which reflects on physiological, social, and psychological attributes that are essential to the quality of life (3).

The effect of aging on oral health includes effect on oral mucosa, lips, teeth and other associated structures, and their functional activity leading to impairment of speech, mastication, swallowing and pain leading to anxiety and depression. Oral tissues are not limited to the teeth and supporting structures (periodontium) but also include salivary glands, temporomandibular joint, orofacial muscles, oropharyngeal mucosa, and oral sensory/motor nerve systems (4).

Swallowing is a critical biological function necessary to sustain life. A healthy swallowing mechanism allows individuals to consume necessary nutrients while also protecting airway from the ingested materials. Although eating is a routine event for the majority of the population, swallowing is a complex process that requires precise coordination and timing of several anatomical structures to ensure

safety and efficiency through every stage of the swallow (5).

Aging is accompanied by major pathophysiological changes that can negatively affect the elderly functional status. particularly, the swallowing function may be altered by the age-related reduction of tissues elasticity, changes of head and neck anatomy, oropharyngeal disorders, decrease of oral moisture, and sensory (i.e., taste, smell) impairments. These changes in swallowing dynamics describe a condition called presbyphagia. On the other hand, aspiration is less likely to be associated with healthy aging, but with increased prevalence of age-related diseases that causes swallowing impairment, which affects 10% to 33% of elderly people (6).

Gerontological health nurse plays a vital role in monitoring oral health, early identification and triaging of oral health problems, and timely referral to dental professionals. Prevention is the key issue in all patients specially elderly. Primary prevention aims at preventing disease, whereas secondary prevention aims at preventing disease recurrence. Disease recurrence refers to disease progression. Primary and secondary prevention and supportive periodontal therapy are strictly related to the ability of maintaining a good oral hygiene (7).

SIGNIFICANCE OF THE STUDY

The world's population is becoming older; the fastest growing age group is those 65 years and over. Egypt is the most populous country in the Middle East and the third-most populous on the African continent (after Nigeria and Ethiopia). One of the main features of the Egyptian population over the last few decades is the gradual increase in the absolute and relative numbers of elderly people. Until January 2019, Egypt's elderly population had reached 6.5 million, 3.5 million males and 3 million females. In 2021, population aged 65 years and above in Egypt was 5.4 %,

growing at an average annual rate of 0.50%⁽⁸⁾.

As stated by results from the World Health Survey (2012), access to dental care ranges from 35% in low-income countries to 60% in lower middle-income countries, 75% in upper-middle income countries and 82% in high-income countries. Moreover, as people age, oral hygiene practice become more difficult because of impaired vision, lower tactile thresholds, cognitive impairment, reduced dexterity, and frailty⁽⁹⁾.

Mohsen et al.⁽¹⁰⁾ showed that, 61.3% of the studied elderly people 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, Egypt. Swallowing problems are a common problem leading to insufficient food and fluid intake and aspiration pneumonia, the epidemiology of swallowing conditions among healthy elders is scarcely reported, but the findings revealed that 11.4% of the participants had swallowing problems⁽¹¹⁾.

According to WHO, there is a distinct lack of policy on prevention of Oral health in Egypt, in addition to a lack of research, data, or planning provisions for dental treatment, so the present study has been conducted to assess oral health and swallowing problems among elderly people at Menofia Governorate⁽¹²⁾.

AIM OF THE STUDY

This study aims, to assess oral health and swallowing problems among elderly people at Menofia governorate through the following objectives:

- 1- Assessing the elderly people oral health status and swallowing problems.
- 2- Determining the relation between elderly people oral health status, swallowing problems and their demographic characteristics.

Research questions

To fulfill the aim of this study the following research questions is formulated:

- 1- What are the elderly people oral health statuses?
- 2- What are the swallowing problems in elderly people?
- 3- Is there a relation between elderly people oral health status, swallowing problems and their demographic characteristics?

SUBJECT AND METHODS

Research design: A descriptive exploratory research design was used to conduct this study.

Setting: The study was carried out in El-Ramad hospital and Menofia University hospital at Shibin El-Kom, Menofia Governorate.

Sampling: - Purposive sample will be used to choose 300 elderly people.

Inclusion criteria;

- Elderly who had 60 years and more.
- Elderly able to communicate.
- Willing to participate in the study.

Exclusion criteria;

- Elderly with reduced cognitive function and those with terminal diseases.
- Elderly people with mouth, throat or esophagus cancer, head & neck cancer and progressive neurologic disease.

Tools for data collection:

1st Tool: A structured interview questionnaire: It was developed by the investigator after review related literature. It composed of 4 parts:

Part 1: Demographic characteristics of the studied elderly: This part included 7 items related to age, sex, and occupation, level of educational level, marital status, living with, and monthly income.

Part 2: Elderly history at the present time this part included 11 questions as: Chronic diseases, medications caused oral side effect, allergy to any medication or food, history of smoking, have oral surgery etc.

Part 3: World Health Organization (WHO) Oral Health Interview Questionnaire for adult⁽¹³⁾, published as a part of the “Oral health surveys basic methods, 5th edition by the WHO in 2013; this questionnaire has been specifically designed for self-filling of information on oral health status.

It includes 9 items as: Number of natural teeth, having mouth or teeth pain, having denture, times of cleaning teeth, method of cleaning teeth, use tooth paste contains fluoride, etc.

Part 4: Swallowing Disturbance Questionnaire (SDQ): Developed by **Cohen & Manor⁽¹⁴⁾**.

SDQ which was originally developed for detecting dysphagia symptoms in elderly people is a self-reporting composed of 19 items and is suitable for patients who could read and understand its contents. The questions covered the common swallowing disturbance that appeared in the oral and pharyngeal phases of swallowing. It consists of 19 questions as; experience difficulty chewing solid food, food residues in the mouth, cheeks, under the tongue or stuck to the palate after swallowing, food or liquid come out of the nose when eating or drinking, chewed-up food dribble from the mouth, have too much saliva in the mouth, drooling or difficulty swallowing saliva, etc.

Scoring system:

The questionnaire contained, assessment 19 items of swallowing problems each was 3 points Liker scale (0 – 2) as zero for Never, 1 for Seldom, and 2 for Always. The Elderly people swallowing problems were evaluated giving a score of 0-38.

The total score of each elderly was categorized into “Minor swallowing problems” when he/she achieved 0 - 13 points of the total score, and those who had 14 - 25 points were considered as “Moderate swallowing problems”, and those who had 26– 38 points were considered as “Sever swallowing problems”.

2nd Tool; Observational Checklist, (Oral Health Assessment Tool for Non-Dental Professionals), the original scale was constructed by the **Kayser- Jones⁽¹⁵⁾** Brief Oral Health Status Examination (BOHSE), Modified by **Chalmers et al.⁽¹⁶⁾**.

It consists of 8 simple categories (Lips, Tongue, Gums and Tissues, Saliva, Natural Teeth, Dentures, Oral Cleanliness, Dental Pain), Designed to assess oral health status for elderly.

Scoring system: The scored ranging from (0, 1, 2) were respectively given to the responses of (healthy, changes and unhealthy). The total score was 16 points classified into (healthy mouth from 0: <8, changes $8 \leq 11$, unhealthy 12: 16).

Validity:-The validity of the tools was done by three experts (Geriatric Health Nursing and Community Health Nursing) who interviewed the tool for content accuracy and internal validity. Also, professors were asked to judge the items for completeness and clarity (content validity). Suggestions were incorporated into the tool.

Reliability: - Reliability was estimated among 10 participants by using test retest method with two weeks apart between them. Then Cronbach alpha was calculated between the two scores using SPSS computer package. It was 0.83 for tool one (questionnaire to assess oral health and swallowing problems among elderly people), and 0.87 for tool two (observational checklist, oral health assessment for non-dental professionals),

which indicates that the tool is reliable to detect the objectives of the study.

Ethical considerations: - An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee, Faculty of Nursing, Helwan University. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where was not accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

Pilot study: - A pilot study was conducted to test the clarity, applicability and understand ability of the tool. It has been conducted on 10% (30) elderly people, no modification done. The elderly people of the pilot study were included in the sample size.

Field work:-

Before conducting the study, an official letter issued from Deas of Faculty of Nursing, Helwan University and directed to the manager of El-Ramad hospital and the manager of Menoufia University hospital in Shibin El-Kom city including the aim of the study to obtain permission after establishing a trustful relationship, each subject interviewed individually by the investigator to explain the study purpose.

Data was collected within 3 months of academic year (2021-2022) two days/week (Sunday, Monday) from 9 am to 2 pm till the needed sample completed, Interviewing the elderly people will be carried out in waiting areas. It expected to take 20 minutes to be filled the tool, the study tool fullfilled by the investigator from each elderly.

Administrative Item:- After explanation of the study aim and objectives, an official permission was obtained from the Dean of Faculty of Nursing and the general manager of El-Ramad hospital and Menofia University Hospital asking for cooperation and permission to conduct the study.

Statistical item:

Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 24. Graphics were done using Excel program. Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using student t- test for comparison between two means, and ANOVA (F) test for comparison between more than two means. Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square (χ^2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used (if the table was 4 cells), or Likelihood Ratio (LR) test (if the table was more than 4 cells). Level of significance was set as P value <0.05 for all significant tests.

RESULTS

Table (1): Distribution of the Studied Elderly People according to the Demographic Characteristics (n= 300)

Demographic characteristics	No.	%
Age (Years)		
60 – 70	163	54.3
71 – 80	102	34
> 80	35	11.7
Mean ± SD 67.8 ± 5.1 years		
Gender:		
Males	149	49.7
Females	151	50.3
Occupation:		
Farmer	67	22.3
Employee	95	31.7
Technical worker	24	8
Pension	114	38
Marital status:		
Single	14	4.7
Married	160	53.3
Divorced	31	10.3
Widowed	95	31.7
Living with:		
Living alone	58	19.3
With family members	242	80.7
Monthly income:		
Not Enough	98	32.7
Enough	156	52
Enough & save	46	15.3

Table (1):- shows that, 54.3% of the studied elderly people aged between 60 to 70 years with mean age 67.8 ± 5.1 years. As regards marital status, 53.3% of them were married and 10.3% were divorced. Concerning monthly income, 32.7% had not enough income, while 52% of them mentioned had enough income

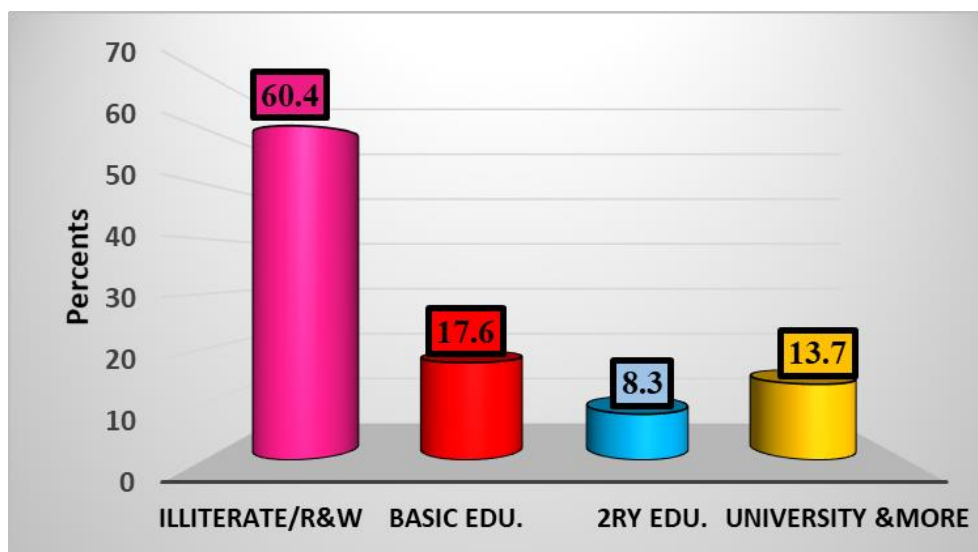


Figure (1): Percentage Distribution of Studied Elderly People according to their Educational Level (n=300)

Figure (1):- Illustrates that, 60.4% were illiterate /read and write while 8.3% of them had secondary education and only 13.7% had University education and above.

Table (2): Distribution of the Studied Elderly People according to their Current Chronic Diseases (n=300)

Chronic diseases	No.	%
Types of chronic diseases		
Neurological diseases.	26	8.7
CVS diseases	81	27
DM	74	24.7
Hypertension	74	24.7
*Others	45	15
Had medications caused oral side effects		
Yes	66	22
No	145	48.3
Don't know	89	29.7
Allergy to any medicine or food		
Yes	70	23.3
No	129	43
Don't know	101	33.7
Ever smoked		
Yes	110	36.7
No	190	63.3
Oral surgery		
Yes	33	11
No	267	89

Bad mouth smell		
Yes	88	29.3
No	160	53.3
Don't know	52	17.4
Cleaning the tongue		
Yes	78	26
No	145	48.3
Sometimes	77	25.7
Using mouth wash		
Yes	48	16
No	170	56.7
Sometimes	82	27.3
Getting Cold sores or any oral lesions		
Yes	128	42.7
No	172	57.3
Getting bleeding gums or hurts		
Yes	129	43
No	171	57
Food caught in between elderly teeth		
Yes	190	63.3
No	110	36.7

*Others= Cancer, Pneumonia, sclerosis.

Table (2): Reveals distribution of chronic diseases of elderly people. Approximately 27% of them had CVS diseases, followed by DM as well as Hypertension 24.7%, and the neurological diseases constituted 8.7%, 36.7% of them were smoked, 23.3% had allergy to any medicine or food, 11% had oral surgery, 26% clean his tongue, and 56.7% don't use mouth wash, Regarding the presence of cold sore or oral lesions, 57.3% of elderly people don't had any cold sores or oral lesions, 57.0% of them don't have gum bleeding or pain, and 63.3% of them had food materials between their teeth.

Table (3): Distribution of the Studied Elderly People according to their Oral Health Status (n= 300)

Elderly people oral health status	No.	%
Number of natural teeth do you have?		
No natural teeth	47	15.7
1 – 9 natural teeth	74	24.7
10 – 19	36	12
≥ 20 natural teeth	143	47.6
During the past 12 months, did your teeth or mouth cause any pain or discomfort?		
Yes	155	51.7
No	119	39.7
Don't know	26	8.6

Have any removable dentures?		
A partial denture		
A full upper denture		
A full lower denture	72	24
Both upper & lower	22	7.4
No, I have not.	3	1
	53	17.6
	150	50
How often do you clean your teeth?		
Never	114	38
2-3 times a month	34	11.3
Once a week	13	4.3
2 – 6 times a week	33	11
Once a day	43	14.4
Twice or more a day	63	21
Use any of the following to clean your teeth?	143	47.7
Toothbrush & toothpaste	54	18
Wooden toothpicks	4	1.3
Thread (Dental Floss)	99	33
*Others		
Use a tooth paste that contains fluoride?		
Yes	120	40
No	180	60
How long is it since you last saw a dentist?		
≤ 1 year	78	26
More than 1 year but less than 2 years	41	13.7
2 years or more but less than 5 years	118	39.3
5 years or more	63	21
Reason of visit to the dentist?		
Consultation/advise	48	16
Pain or trouble with teeth, gums or mouth	162	54
Treatment/ follow-up treatment	17	5.7
Don't know /don't remember	73	24.3

*Others= Plastic toothpicks, Gurgle with vinegar.

Continue table (3):-

Because of the state of your teeth or mouth, how often have you experienced any of the following problems during the past 12 months?	Often		Sometimes		Never	
	No.	%	No.	%	No.	%
Difficulty in biting foods	87	29	130	43.3	83	27.7
Difficulty chewing food	98	32.7	126	42	76	25.3

Difficulty with speech/trouble pronouncing words	204	68	56	18.7	40	13.3
Dry mouth	142	47.3	112	37.3	46	15.3
Felt tense because of problems with teeth or mouth	137	45.7	111	37	52	17.3
Had sleep that is often interrupted	133	44.3	119	39.7	48	16
Difficulty doing usual activities	156	52	97	32.3	47	15.7
Have reduced participation in social activities	153	51	96	32	51	17

Table (3): Indicates that, 47.6% of elderly people have ≥ 20 natural teeth, during the past 12 months 51.7% of them were suffering from teeth or mouth pain or discomfort, 50.0% of them didn't had any removable dentures, and 38.0% of them never clean their teeth. 68.0% of the elderly people often had difficulty with speech/trouble pronouncing words.

Table (4): Distribution of the Studied Elderly People according to their Swallowing Disturbance Problems (n= 300)

Swallowing problems	Never		Seldom		Always	
	No.	%	No.	%	No.	%
Experience difficulty chewing solid food, like an apple, cookie or a cracker.	82	27.3	134	44.7	84	28
Any food residues in the mouth, cheeks, under the tongue or stuck to the palate after swallowing.	85	28.3	133	44.3	82	27.4
Food or liquid come out of the nose when you eat or drink.	196	65.3	71	23.7	33	11
Chewed-up food dribbles from the mouth.	184	61.3	89	29.7	27	9
Feel you have too much saliva in the mouth: drool or have difficulty swallowing saliva.	182	60.7	89	29.7	29	9.7
Need to swallow chewed-up food several times before it goes down the throat.	134	44.7	133	44.3	33	11
Experience difficulty in swallowing solid food.	117	39	118	39.3	64	21.3
Experience difficulty in swallowing pureed food.	201	67	81	27	18	6
While eating, you feel as if a lump of food is stick in the throat.	155	51.7	124	41.3	21	7
Cough while swallowing liquids.	170	56.7	108	36	22	7.3
Cough while swallowing solid foods.	153	51	120	40	27	9

Experience a change in the voice, such as hoarseness or reduced intensity immediately after eating or drinking?	191	63.7	83	27.7	26	8.7
Other than during meals, you experience coughing or difficulty breathing as a result of saliva entering the windpipe.	181	60.3	104	34.7	15	5
Experience difficulty in breathing during meals.	170	56.9	103	34.3	27	9
Suffered from a respiratory infection (pneumonia, bronchitis) during the past year.	105	35	139	46.3	56	18.7
Swallowing problems interferes with my ability to go out for meals.	182	60.7	83	27.7	35	11.6
Swallowing problems has caused me to lose weight.	171	57	104	34.7	25	8.3
The pleasure of eating is affected by swallowing problems.	138	46	102	34	60	20
Swallowing is painful & stressful.	160	53.3	104	34.7	36	12

Table (4): Illustrates that, 28.0% of the elderly people always experience difficulty chewing solid food like an apple, cookie or a cracker, 44.3% of them seldom had residues food in the mouth, cheeks, under the tongue or stuck to the palate after swallowing, 67.0% of them never experience difficulty in swallowing pureed food.

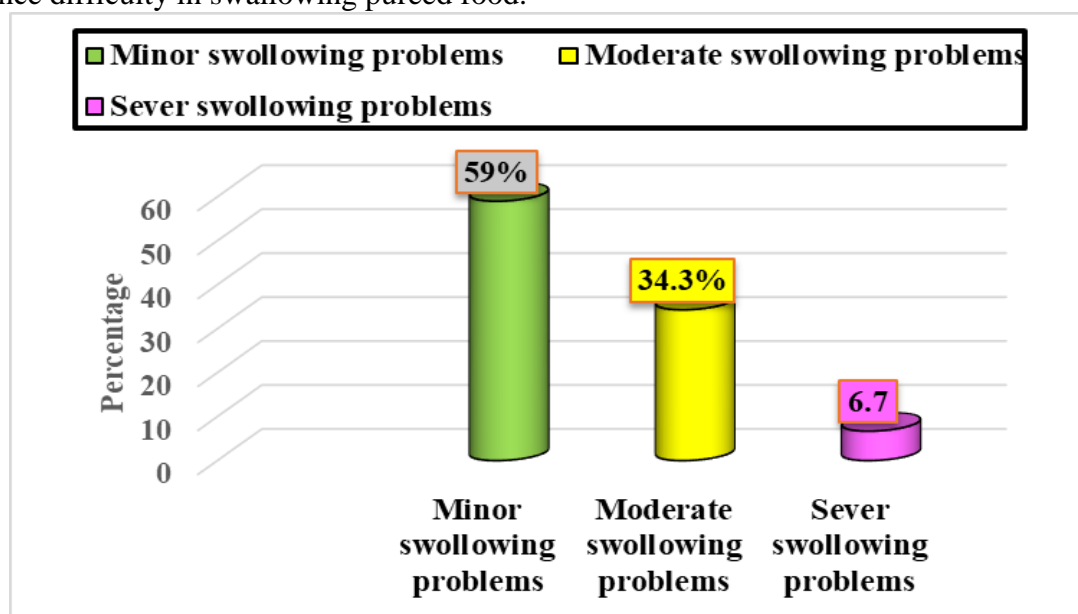


Fig (2): Percentage Distribution of Total Swallowing Problems Levels among Studied Elderly People (n=300)

Figure (2): This figure shows that, 59.0% of the elderly people had minor swallowing problems, 34.3% of them had moderate swallowing problems, while 6.7% of them had severe swallowing problems.

Table (5): Distribution of the Studied Elderly People according to their Observed Oral Health Status (n= 300)

Oral Health Assessment	Healthy		Changes		Unhealthy	
	No.	%	No.	%	No.	%
Lips	174	58	113	37.7	13	4.3
Tongue	191	63.7	82	27.3	27	9
Gums & Tissue	176	58.7	109	36.3	15	5
Saliva	156	52	127	42.3	17	5.7
Natural Teeth: Present: 273 (91%) Absent: 27 (9%)	85	31.1	124	45.4	64	23.5
Having Denture(s): Yes: 157 (52.3%) No: 143 (47.7%)	56	35.7	81	51.6	20	12.7
Oral cleanliness:	138	46	125	41.7	37	12.3
Dental pain	185	61.7	91	30.3	24	8

Table (5): Indicates that, 63.7% of the elderly people had a healthy tongue, 42.3% of them had changes in saliva, while 23.5% of them had unhealthy natural teeth.

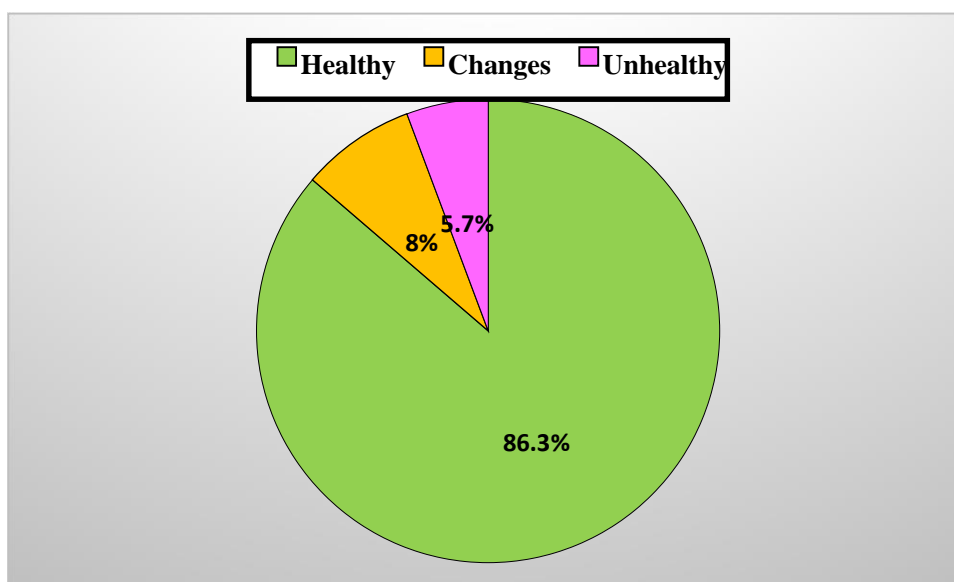


Figure (3): Distribution of the Studied Elderly People according to Total Levels of Observed Oral Health Status (n=300).

Figure (3):- Demonstrates that 86.3% of studied elderly had healthy oral health, while only 5.7% had unhealthy oral.

Table (6): Relation between the Elderly People Demographic Characteristics and their Swallowing Problems (n= 300)

Demographic characteristics		Swallowing Problems (SP)							
		Minor SP		Moderate SP		Sever SP		Chi-square	
		N	%	N	%	N	%	X ² / LR	Pvalue
Age (years)	60- 70 (n=163)	99	60.8	53	32.5	11	6.7	2.9	0.56 NS
	71 – 80 (n=102)	57	55.9	40	39.2	5	4.9		
	> 80 (n=35)	21	60	10	28.6	4	11.4		
Gender	Male (n=149)	89	59.7	57	38.3	3	2	10.9	<0.004 HS.
	Female (n=151)	88	58.3	46	30.5	17	11.2		
Education level	Illiterate/Read&Write(n=181)	91	50.3	72	39.8	18	9.9	43.4	<0.0001 HS
	Basic education(n=53)	29	54.7	24	45.3	0	0		
	Secondary edu. (n=25)	20	80	3	12	2	8		
	University&above(n=41)	37	90.2	4	9.8	0	0		
Occupation	Farmer(n=67)	38	56.7	26	38.8	3	4.5	24.7	<0.0001 HS
	Employee(n=95)	69	72.6	25	26.3	1	1.1		
	Worker (n=24)	9	37.5	14	58.3	1	4.2		
	Retired (n=114)	61	53.5	38	33.3	15	13.2		
Marital status	Single(n=14)	13	92.9	1	7.1	0	0	23.1	<0.001 HS
	Married(n=160)	82	51.3	69	43.1	9	5.6		
	Divorced (n=31)	25	80.6	5	16.2	1	3.2		
	Widowed(n=95)	57	60	28	29.5	10	10.5		

Living with	Alone(n=58)	39	67.2	15	25.9	4	6.9	2.4	0.29 NS
	With a family members(n=242)	138	57	88	36.4	16	6.6		
Monthly Income	Not Enough(n=98)	57	58.2	34	34.7	7	7.1	7.4	0.11 NS
	Enough(n=156)	89	57.1	54	34.6	13	8.3		
	Enough & save(n=46)	31	67.4	15	32.6	0	0		
Total		177	59	103	34.3	20	6.7		

NS= No statistical significance (P > 0.05) Sig= Significant HS=High statistically Significant

LR= LikelyHood Ratio (one type of Qui square used when expected Qui square is less than 5).

Table (6): Shows that, there were highly statistically significant differences found between the elderly peoples' total score of swallowing problems and their gender, educational level, occupation, and marital status at (P<0.001), while there were no statistically significant differences found between the elderly peoples' total score of swallowing problems and their age, living with, and monthly income at (P>0.05).

Table (7): Relation between the Elderly people socio-demographic characteristics and their levels of oral health assessment (n= 300)

Demographic characteristics		Levels of oral health assessment							
		Healthy		Change s		Unhealth y		Chi-square	
		N	%	N	%	N	%	X ² / LR	Pvalue
Age (years)	60- 70 (n=163)	138	84.7	12	7.3	13	8	5.4	0.24 NS
	71 – 80 (n=102)	92	90.2	8	7.8	2	2		
	> 80 (n=35)	29	82.9	4	11.4	2	5.7		
Gender	Male (n=149)	131	87.9	13	8.7	5	3.4	3.1	0.21 NS
	Female (n=151)	128	84.8	11	7.3	12	7.9		
Education	Illiterate/Read & Write(n=181)	142	78.4	22	12.2	17	9.4	LR= 25.2	<0.0001
	Basic education(n=53)	53	100	0	0	0	0		HS

	Secondary edu. (n=25)	25	100	0	0	0	0		
	University&above(n=41)	39	95.1	2	4.9	0	0		
Occupation	Farmer(n=67)	59	88.1	7	10.4	1	1.5	LR = 8.1	0.06 NS
	Employee(n=95)	86	90.5	4	4.2	5	5.3		
	Worker (n=24)	21	87.5	3	12.5	0	0		
	Retired (n=114)	93	81.6	10	8.8	11	9.6		
Marital status	Single(n=14)	12	85.8	1	7.1	1	7.1	LR= 22.1	<0.001 HS
	Married(n=160)	148	92.4	10	6.3	2	1.3		
	Divorced (n=31)	24	77.4	6	19.4	1	3.2		
	Widowed(n=95)	75	78.9	7	7.4	13	13.7		
Living with	Alone(n=58)	46	79.3	5	8.6	7	12.1	4.7	0.09 NS
	With a family members(n=242)	213	88	19	7.9	10	4.1		
Monthly Income	Not Enough(n=98)	79	80.6	10	10.2	9	9.2	LR= 16.5	<0.002 HS
	Enough(n=156)	134	85.9	14	9	8	5.1		
	Enough & save(n=46)	46	100	0	0	0	0		
Total		259	86.3	24	8.0	17	5.7		

NS= No statistical significance (P > 0.05) **Sig.** = Significant **HS**=highly statistically Significant **LR**= LikelyHood Ratio (one type of Qui square used when expected Qui square is less than 5).

Table (7): Presentes that, there were highly statistically significant relation found between the elderly peoples' levels of oral health assessment and their educational level, monthly income, and marital status at (P<0.001), while there were no statistically significant relation found between the elderly peoples' levels of oral health assessment and their age, gender, occupation, and living with whom (P>0.05 for each).

DISCUSSION

Oral health can be described as having a comfortable and functional dentition that enables individuals to continue their social role; it is integral to general health and essential to wellbeing. The mouth reflects the health and well-being of a person during a lifetime. Good oral health is a vital part of everyday life. Poor oral health is intimately associated with economic deprivation, social exclusion, and cultural difference. Emerging evidence has demonstrated a strong relation between the effects of oral disease and overall health. The mouth is the entrance to the rest of the body. Oral disease is associated with chronic disorders such as heart disease, stroke, respiratory infections, diabetes and food troubles ⁽¹⁰⁾.

Part I: - Demographic characteristics of elderly people.

Regarding elderly people age, the current study revealed that more than half of studied elderly people aged from 60 to 70 years old with Mean \pm SD of 67.8 ± 5.1 (**table 1**): this result agreed with **Charleekrua et al.** ⁽¹¹⁾ in Thailand, who studied “swallowing problems among community-dwelling elderly people”, as reported that 53.8% of studied sample were 60-69, on other hand this result disagreed with **Morishita et al.** ⁽¹⁷⁾ in Japan, who done a study about “relationship between mortality and oral function of elderly people requiring long-term care” as reported that the mean age of studied sample was 81.8 years.

As regards educational level, the current study illustrated that, two thirds of the studied sample were illiterate/ can read and write, this result goes in same line with **Elhddad et al.** ⁽¹⁸⁾ in Libya who studied “oral health related quality of life among completely edentulous patients”, as demonstrated that 52.1% of the studied elderly were illiterate; this could be attributed to low levels of education in this

generation in Egypt, particularly in rural areas where people's education is usually lower, especially at a time when it was not mandatory.

Regarding income, the current study revealed that more than half of the studied elderly people had enough income, this result in contrary with **Abd Allah et al.** ⁽¹⁹⁾ in Egypt, who studied “assessment oral health knowledge and oral self-care practices among rural elderly”, who reported that income not sufficient.

Part II: - Health history of elderly people.

In relation to the present chronic disease, the current study illustrated that more than one quarter of studied elderly people were suffering from chronic disease the most common disease was cardiovascular diseases (**table 2**): this result agreed with **Abd Allah et al.** ⁽¹⁹⁾ in Egypt as studied “educational program to improve quality of life among elderly regarding oral health”, as demonstrated that the most common diseases were hypertension (58.7%), otherwise this result disagreed with **Morishita et al.** ⁽¹⁷⁾ as reported that 56% of studied sample had cerebrovascular disorder.

In addition, the current study showed that about half of the studied elderly people, don't have oral side effects due to medications, or history of allergy to any medication or food, this result congruent with **Zelig et al.** ⁽²⁰⁾ in Canada, who studied “dentition and malnutrition risk in community dwelling older adults”, as reported 58% of studied sample didn't had any oral side effect from medication. This result might be due to the drug they used didn't had side effect on the mouth.

The current study revealed that more than half of elderly didn't use mouth wash. This result in same line with **Damares et al.** ⁽²¹⁾ in Barazil, who studied “educational program in oral health for caregivers on the oral hygiene of dependent elders”, who

reported that 92.6% of elderly didn't apply mouth wash before program.

The current study revealed that more than half of elderly people don't have any cold sores or oral lesions, this result in confirmity with **Radwan-Oczko et al.** (22) in Poland, who studied "prevalence and characteristic of oral Mucosa lesions", as reported that 61% of studied sample hadn't any sores or lesion; but this result disagreed with **Rayani et al.** (23) in Bandar Abbas, who studied "prevalence of oral mucosal lesions and related risk factors in elderly people residing in nursing homes" as reported that Oral lesions were observed in 69.1% of the subjects.

In addition, the current study illustrated that more than three quarters of them had food materials between their teeth. this result is supported by **El-Lassy** (24) in Egypt, who studied "oral health status of elderly living in residential homes" as reported that 80% of studied sample had food materials between teeth, but this result disagreed with **Tian et al.** (25) in China, who studied "differences in the oral health status in hospitalized stroke patients according to swallowing function" as reported that 73% of studied sample hadn't food between teeth. This might be due to presence of broken teeth and loss of some that lead to gaps between teeth causing food caught.

Part III: - Answering research question (1) what are the elderly people oral health statuses?

Regarding natural teeth, the current study indicates that about half of the elderly people had \geq 20 natural teeth (**table 3**); this result is supported by **Koistinen et al.** (26) in Sweden, who studied "oral health and oral care in short-term care: prevalence, related factors and coherence between older peoples' and professionals' assessments", as mentioned that 43% of studied sample had \geq 20 natural teeth.

The present study demonstrated that more than half of the studied sample were suffering from teeth or mouth pain or discomfort, this result is similar to a study carried out by **Ghayth et al.** (27) in Egypt, who studied "knowledge and reported practice among elderly people with oral and dental problems", as reported that 97.7% of studied sample had mouth pain or discomfort.

Also the present study demonstrated that half of elderly people don't had any removable dentures; this result is contradicted with **Damares et al.** (21) as reported that 62 % of studied sample removable artificial dentures; this might be most of them that more than 20 teeth that help them to chew food and didn't need for additional artificial denture.

The current study demonstrated that more than one thirds of the studied elderly never clean their teeth, this result in same line with **Abd Allah et al.** (19), as reported that 39% of studied sample never clean their teeth, but this result disagreed with **Shao et al.** (28) in China, about "sociodemographic factors, dental status and health-related behaviors associated with geriatric oral healthrelated quality of life", as mentioned that 9.5% of studied sample never brush their teeth. This might be due to the old age unable to perform activities of daily living about care, lack of awareness and low income.

The current study illustrated that about half of elderly people were cleaning their teeth using tooth brush & toothpaste, this result in same line with **Chahar et al.** (29), in India about "oral healthrelated quality of life among elderly patients visiting special clinics in public hospitals", as mentioned that 48.2% of studied sample use tooth brush and toothpaste.

Also the current studied illustrated that two thirds of the studied elderly don't use toothpaste that contain fluoride this result agree with a study carried out by

Šapurić & Tozja⁽³⁰⁾ in From, about “assessment of knowledge and attitudes to preserve oral health among older people aged 60+” as reported that 33% of studied sample use toothpaste that contain fluoride. This might be due to this described by physician.

In addition to, the current study revealed that more than half of studied elderly people visited the dentist because they were suffering from pain or trouble with teeth, gums or mouth, this result is congruent with Ghayth et al.⁽²⁹⁾, as reported that 53.1% of the studied sample visit the dentist because they had pain and problem of tooth, on other hands ;this result disagreement with MenesesGómez et al.⁽³¹⁾ in Colombia, who studied “oral health-related quality of life in the elderly population receiving health care at the public hospital network” as reported that 97% of studied sample had dental problem but didn't visit the physician.

Part IV: - Answering research question (2) what are the swallowing problems in elderly people?

The present study illustrated that, more than two thirds of the elderly people never experience difficulty in swallowing pureed food (**table 4**); this result disagreed with Haresaku et al.⁽³²⁾ in Japan, who studied “associations of oral health-related quality of life with age, oral status, and oral function among psychiatric inpatients” as reported that 45 % had difficult in swallowing food.

Also, the current study demonstrated that about half of elderly people rarely had residues food in the mouth, cheeks, under the tongue or stuck to the palate after swallowing, this result consistent with Koistinen et al.⁽²⁶⁾ in Sweden, who studied “oral health-related quality of life and associated factors among older people in short-term care”, as reported that 79% of studied sample feeling discomfort when eating as a residual food in mouth.

The current study revealed that more than two thirds of the elderly people never experience a change in the voice, such as hoarseness or reduced intensity immediately after eating or drinking, this result parallel with Junior et al.⁽³³⁾ in parazil, who studied “characterization of tongue pressure in the elderly”, as reported that 60% of studied sample didn't had any swallowing problem.

In addition, the current study demonstrated that about half of studied elderly people rarely suffered from a respiratory infection (pneumonia, bronchitis), this result in same line with Furuta & Yamashita⁽³⁴⁾ who studied “oral health and swallowing problems”, as reported that one thirds of study sample were suffered from a respiratory problem. This result might be due to difficult chewing.

The current study revealed that about two thirds of the studied elderly people had minor swallowing problems, this result parallel with Hägglund et al.⁽³⁵⁾ in Sweden who studied “older people with swallowing dysfunction and poor oral health are at greater risk of early death”, as reported that 64% of studied elderly people had swallowing problem. This might be due to they had poor chewing for the food

Part V: Oral health assessment among elderly people

The current study revealed that more than two thirds of the studied elderly people had a healthy tongue (**table 5**); this result is supported by Damares et al.⁽²¹⁾ as reported that 55% of studied sample had healthy tongue.

The current study revealed that less than half of the studied sample had saliva change, this result in the same line with Visschere et al.⁽³⁶⁾ as mentioned that 55% of studied sample had mouth mucosal & saliva change. This result might be due to old age that decreases saliva secretion.

Moreover, the current study demonstrated that about one quarter of studied elderly had changes in teeth, these findings goes on line with that of **Simpelaere et al.** ⁽³⁷⁾ who found that half of the studied “elderly had unhealthy natural teeth and oral cleanliness”. This might be due to poor hygienic care of the teeth, and limited dentist visiting among the majority of the studied elderly.

The present study demonstrated that more than three quarter of the studied elderly had healthy oral health status, this result in the same line with **Koistinen et al.** ⁽³⁾, as reported that 84% of studied sample had good oral status. This result conversely with **Ghayth et al.** ⁽²⁷⁾ who found that 55.8% of the studied elderly had unhealthy oral status and more than 44.2% of them had healthy oral status. This might be due to wash teeth with tooth paste.

Part VI: Answering research question (3) is there a relation between elderly people oral health status, swallowing problems and their demographic characteristics?

More ever, the current study concluded the relation between elderly people’s demographic characteristics and their total score of swallowing problem that, there were highly statistically significant differences found between the elderly peoples' total score of swallowing problems and their gender, educational level, occupation, and marital status (**table 6**), this result conversely with **Ibrahim et al.** ⁽³⁸⁾ in Egypt, who studied “factors associated with aspiration risk among Geriatric Patients with Dysphagia”, as reported there was no statistically relation between swallowing problem and gender, educational level. This explained that low educational level decrease elderly awareness related swallowing problem and no working decrease communication with others which reflect passively on their awareness.

Finally, the current study illustrated that there were no statistically significant differences found between the elderly peoples' total score of swallowing problems and their age, living with, and monthly income, this result disagreed with **Hollinghurst & Smithard** ⁽³⁹⁾ in united kingdom, who studied “identifying dysphagia and demographic associations in older adults Using electronic health records”, and confirmed the association of dysphagia with increasing age and frailty. The present in the same line with **Musacchio et al.** ⁽⁴⁰⁾ in Italy, in a studied carried out about “tooth loss in the elderly and its association with nutritional status, socio-economic and lifestyle factors” as reported that difficulties in chewing and in swallowing were associated with age.

There were highly statistically significant differences between the elderly peoples' total levels of oral health assessment and their educational level, marital status and monthly income (**table 7**), this result agree with **Abd Allah et al.** ⁽¹⁹⁾, who found that the educational level, marital status and monthly income had statistically significant predictor in elderly oral health.

CONCLUSION

Based on the results of the present study: - Significant relation between elderly people demographic characteristics and their oral health as in educational level, marital status and monthly income except in age, gender, occupation and living with also their swallowing problems and demographic characteristics as in gender, educational level, occupation and marital status except in age, living with and monthly income.

RECOMMENDATIONS

1. An educational program concerning oral health and swallowing problems

among elderly people on large sector and other setting

2. Continuous oral and dental health initiative is needed; low income elderly must be given a follow-up card to direct them to the hospital to perform the advanced and required medical interventions free of charge.
3. Finally, it is important to disseminate the findings of such investigations to the appropriate authorities in order for action to be taken.

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