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THE ORAL HEALTH STATUS OF ATTENDEES AND RESIDENTS IN UAE CARE HOMES

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ABSTRACT

The Oral Health Status of Attendees and Residents in UAE Care Homes

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Background: The oral health status of day stay attendees and residents in care homes in the UAE has not been previously investigated. This cross-sectional study aimed to determine the oral health status of care home attendees and residents in the UAE.

Materials and Methods: All care homes identified from the UAE Ministry of Health website were selected and all subjects attending or residing in care homes were included, forming a convenience sample. The WHO classification was used for medical conditions. Oral and dental status was recorded on the WHO Oral Health Assessment form for adults (2013) and other demographic details were recorded separately. The three examiners had training and calibration exercises prior to conducting the dental examinations. A mean inter-examiner Kappa of 0.6 was achieved.

Results: A total of 107 participants with a mean age of 67.5 years (sd 15.65years) were examined in 4 Emirates. Nineteen subjects had significant cognitive impairment and could not co-operate and only partial examination was possible. Males (n=57) had a mean age of 69.2yrs (sd 16.3) which was not significantly different to the mean age of females (65.5yrs, sd 14.8). Most of the participants (n=70) had an ASA classification of mild systemic disease whilst 25 were classified with severe systemic disease. Multiple medical problems were most common (n=28), followed by endocrine disease (n=26) and mental health problems (n=20). Circulatory disease was present in 9 subjects and stroke/nervous system problems in 6 participants. Periodontal problems were present in 58 (72%) of 81 dentate participants since 26 participants were edentate. Overall mean DMFT was 23.2 (sd 9.0) but mean DMFT in males was significantly greater (26.5) compared to females at 19.8 ($p<0.001$). Age had a weak positive correlation with DMFT, Spearman's rho = +0.43 ($p<0.001$). Eighteen participants out of 88

(20.5%) complained of pain or soreness at the time of examination. The frequency of tooth brushing/cleaning the mouth was not correlated to participants' mobility (being bed-bound). Linear regression analysis of DMFT (dependent variable) and age, education, and ASA as predictor variables resulted in significant predictive value for the variance of DMFT accounted for by age and education but not ASA.

Conclusion: Oral health was generally poor with high caries experience. Pain and discomfort were present in a high number of participants. Dental care is a priority for this group.

DEDICATION

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents, who have been source of inspiration and gave me strength when I thought of giving up, who continually provide their prayers, moral, spiritual, emotional and financial support.

To my brothers, sisters, aunt, friends for being a source of support and encouragement.

To all who have served as my inspiration to be specialized in prosthodontics.

DECLARATION

I, **Banan Mohammed Almazrooei**, declare that this dissertation is my own original work, and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Name:

Signature:

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1. INTRODUCTION:

Global demography is changing and the proportion of people aged 60 years and over is increasing.(1) The elderly may suffer from many health problems including oral health issues. Oral health and general health are closely associated.

In 2015, globally there were 901 million people aged 60 years and over, comprising 12 percent of the global population.(2) The United Arab Emirates (UAE) with a population of over 9,157,000 including expert is rapidly developing. The number of people over 60 years of age was 2.3 percent of its population in 2015. This percentage is anticipated to increase to 23.5 percent in 2050.(2) During the period from 1990 to 1995, average life expectancy in the UAE was 72.2 years; in 2045-2050 this number is anticipated to reach 82.7 years.(2)

The majority of older people in UAE live with their families, and only a small number live in care homes. There is limited information about the dental care needs of elderly people in the UAE in general and of elderly people in care homes in particular. The oral and dental health needs of this group of the population are poorly understood. An increase in dependency and need for assistance with personal care can make the maintenance of oral health for the older population a complex issue. A clear understanding of baseline oral health status and treatment needs is essential to establish oral health priorities. These basic data is important to answer complex research questions, to determine how and where to direct education and treatment interventions.

It is important to understand the oral health status of the elder care home population. Such data is beneficial for treatment needs assessment and future oral care plans. Most industrialized countries have information about the oral health status of old-age people, while relatively few systematic surveys on oral health status have been undertaken in developing countries. It is essential for dental educational institutions, government bodies and community groups to have access to information

about those older populations in the UAE who develop oral and dental diseases. Many other countries have established data about the dental health status of care home residents.

Neglected mouths, failing restorations and poor plaque control encourages the development of caries and subsequent tooth loss if no appropriate treatment is carried out. Severe dental caries and periodontal diseases are the major reasons for tooth loss.(3,4) Among people with high tobacco use, smoking is also shown to be a risk factor for tooth loss.(5) Irregular dental attendance may result in undiagnosed soft tissue lesions in the elderly, the most important being oral squamous cell carcinoma. Denture-related lesions include denture stomatitis, denture hyperplasia, and traumatic ulcers.

Surveys indicate that the mean number of decayed and filled coronal surfaces range from 22 to 35 in developed countries.(6–8) The second national oral health survey in China showed that the mean number of decayed and filled teeth was 2.5 in old age.(9) In India the mean number of decayed teeth was 2.5.(10) The mean number of decayed and filled root surfaces in older people in developed countries is between 2.2 and 5.3.(8)

Epidemiological studies in different countries show that the percentage of people with Community Periodontal Index scores 4 (deep pockets) ranges from 5 to 70% among older people.(11)

Several reports worldwide have shown that the use of professional dental health services is low among older people, particularly among socioeconomically disadvantaged people. Impaired mobility, lack of independence, lack of dental care tradition and negative attitude towards oral health care providers can deter these older people from seeking dental treatment.

Karki et al(12) conducted a study to evaluate the oral health study status of older people living in care homes in Wales, UK. Their study found an overall poor dental status with 72.8% of residents having tooth decay with only 37% of residents brushing their teeth/denture twice a day.

In another study by Tomson et al (13) a short questionnaire and a clinical examination were used to capture data relating to the oral health status of a sample of care home residents in the West Midlands, UK. The prevalence of caries among dentate residents was 55.8% with 56% of the residents being dentate and 43.6% edentate. In Saudi Arabia, the status of oral health of older people in residential homes was evaluated in a survey done by Al-Shehri.(14) A total number of 129 elderly residents were interviewed and clinically examined according to WHO criteria. The results of their study showed the mean number of DMFT to be 18.6 ± 12.6. The mean number of decayed roots was 2.75 ± 3.95. The oral health status and care received among 412 nursing home residents in 22 randomly selected nursing homes in Avon, UK, revealed that over 70% had not seen a dentist for over 5 years, and over 22% reported a current dental problem. (15) Calculus was present in 82% of subjects and root caries in 63% of subjects. In a similar study in Turkey, 193 of the elderly in a residential home in Ankara were interviewed and clinically examined according to WHO criteria.(16) A functional dentition was present in only 7.3% of subjects, the mean DMFT was 29.3 ± 5.8 and mean root caries was 2.2 ± 3.1. Edentulism was present in 67.4% while 11.9% lacked a denture in either jaw.(17) To date no equivalent study have been conducted in the U.A.E.

2. LITERATURE REVIEW:

Population increase in the developing countries, is not due to an increase in birth rate but is a result of the elderly living longer as they have a good quality of life.(18) Oral health-related quality of life (OHRQoL) is defined as a self-report specifically regarding oral health that includes functional, social and psychological impact of oral disease.(18) There are barriers which restrict access to medical care in the elderly such as impaired vision and hearing, reduced mobility and chronic disease with resultant effects on oral health and function, which in turn can lead to malnutrition.(18) Rekhi et al. used the Geriatric Oral Health Assessment Index (GOHAI), to measures institutional elderly patients with oral functional problems and assesses the psychosocial effect of oral disease.(19) The modified WHO survey was used and the elderly were clinically examined regarding the status of teeth and the oral mucosa. The survey included 500 elderly, 279 females, and 221 males. The elderly with some level of education showed better (GOHAI) scores compared to the uneducated. Males had significantly higher mean (GOHAI) scores indicating better OHRQoL compared to females. This was reported also, by Chavers et al.(20) The oral health status reduces with age due to an increase in untreated disease.(21) Ekanayke and Perera reported that the assessment of OHRQoL with more than 20 teeth among elderly.(22) In Brazil, Hugo et al. reported the elderly people assessed their OHRQoL negatively if fewer than 20 teeth,(23) and Steele et al. reported the oral health perception determined by the number of teeth present.(18,24) A better OHRQoL was seen in younger patients with better education.(18)

More older adults keep their teeth in the UK than ever before. The Adult Dental Health Survey reported that 40% have 21 or more natural teeth above the age of 75years and 5% have 18 sound and untreated teeth.(25,26) There is a high level of dependency, cognitive impairment and multiple morbidities in UK care home residents.(25,27) In this study the age group was from 39 to 102 years, and three-quarters of the participants were female, and they were reported to be in good or

very good general and dental health. The majority of care home residents needed dental treatment, but case complexity prevented the delivery of treatment. Some residents could not afford conventional restorative care. In Wales, the majority of care home residents had poor oral health. The ADHS 2009 reported that 30% of 75-84 years old, and 47% aged 85 year and above were edentulous in a sample where 51% were male, and 59% were female among the care home residents.(25,26) Many of these residents had no complaints and were not considered to have an oral health problem, despite some having dental caries. Also, most of the dentate residents needed oral hygiene and periodontal care and better treatment planning.(25)

It is essential for older people to chew and swallow food, so they need a healthy oral cavity to perform these functions, as lack of oral health may adversely affect general health and the quality of life. Now a days many elderly people can retain their natural teeth (World Health Organization, 2006).

There are medical factors that may reduce oral care in the elderly people, for example, neuromuscular control, vision and musculoskeletal disorders. Medication can cause a reduction in salivary production which will increase the risk of oral problems such as caries, ulcers and bad breath which may lead to difficulties in eating, speaking and wearing dentures. The reason for not wearing dentures must be identified to help the patient in maintaining good chewing function and nutritional status.(28)

Oral disease is often undetected in care home residents, but few are concerned about this disease despite negative affects on eating, speech, behavior, appearance and social interaction.(29) Poor oral hygiene also affects nutrition of older people and the quality of life. Elderly with poor oral health can be more prone to systemic disease such as cardiovascular and stroke.(29) So it is important to have good dental prevention and education programs for care home residents, but there are barriers which may cause difficulties in providing oral care. One of the limitations in

Australia was the shortage of geriatric specialized dental health care providers, because problems or diseases of the oral cavity are not visible to healthcare providers who take care of the elderly in care homes. Furthermore, there is no dental protocol and no guidelines for the healthcare provider. Each care home may have different ways of managing the oral problems of elderly residents but due to the workload and shortage of the staff, there is no time for the oral care of the elderly. One of the barriers is that some of the elderly are bedridden, so it is difficult to transport them to dental facilities despite the healthcare provider knowing that oral care is essential for the elderly, but it has a low priority.(29) Another barrier is poor communication with the dentist and many dentists do not have an interest in treating care home residents.(29)There is insufficient education in geriatric dentistry which may provide another barrier for care. A stressful, difficult and isolated work environment has few attractions for the dental professional to work in. It is also often very difficult for residents to sign the consent for dental care. Some of the residents can be uncooperative and not allow the provider to examine or provide oral care. Other potential barriers are the high cost of dental treatment and the lack of insurance.(29) It is important that all healthcare providers and nursing staff provide daily oral health care and that dentists and hygienists provide not only oral treatment but also education and training for the carers to facilitate the oral care of residents.(29)

A study in Florida care home residents by Frenkel et al. found that 22% had an untreated oral problem and over 70% had not seen a dentist in over 5 years.(30) Many residents had physical and mental problems such they could not perform oral hygiene by themselves, resulting in a high number of residents suffering from a range of serious oral health problems.(30) In the USA, the proportion of the population aged 65 years or older will nearly double between 2000 and 2030 from 12.6% to 20% and the proportion of the population aged 85 years and older will increase over the next 10-15 years.(30) There are no difference in the standard of care provided in Florida

care home residents, but there are need for daily and periodically oral care for the elderly in care home residents to maintain a good standard of oral health and hygiene.(30) The proportion of edentulous nursing home residents was 20.4%. So it is essential to examine soft tissue for lesions including squamous cell carcinoma.(30) In this study they found a high percentage of residents with calculus (79.6%) indicating lack of proper oral hygiene and possibly a lack of training or lack of time for oral hygiene .(30) The authors also, found that 75% of the residents were not able to clean their own teeth because they do not have any assistance. The poor oral hygiene led to many problems in the care home residents.(30) One Japanese study found that only 54% of care home staff had been trained for oral cleaning.(30) So it is essential to train the care provider to clean teeth and dentures and to detect caries, periodontal disease and soft tissue lesions to ensure a good quality of oral health in care home residents.(30)

Some care home residents suffer from physical, mental and cognitive impairment which can adversely affect the oral health of residents living in care homes. The assessment of cognitive impairment by the nurse or the caregiver is difficult. Specialty doctors can evaluate the level of impairment for each resident, and the loss of higher-level reasoning, memory, learning disabilities, attention deficiency, decreased intelligence and mental function.(31) Also cognitive impairment can be increased by depression, diabetes and stroke.(31) The US National Nursing Home Survey (1995) revealed that nearly 50% of nursing home residents had lost their natural teeth entirely and more than 40% of the residents reported difficulty biting or chewing.(31) They also found that residents with cognitive impairment had poor oral health, had difficulties communicating their oral health needs with a dental provider and could not perform good oral hygiene by themselves and needed help.(31) The impaired elderly had a higher caries rate, edentulousness, plaque and more restorations than the non-cognitively impaired.(31) There must be training programs for staff in

care homes to evaluate and diagnose the severity of any cognitive impairment and thus focus on oral health in this particular group of residents.

The Geriatric Oral health assessment index was used to evaluate the oral health of elderly care home residents in Serbia.(32) The index evaluates oral health and is composed of 12 questions regarding physical function including nutrition, speech, ingestion, psychosocial wellbeing, appearance dissatisfaction, self-awareness, avoidance of social contacts due to oral problems and pain or discomfort including the use of painkillers.(32) Residents had a low geriatric oral health assessment score indicating poor oral health and high need for treatment, not to mention an adverse effect on the Serbian residents quality of life.(32) And they reported that the edentulous and pain free elderly residents consider as a good oral health as self-assessment, so it is essential to improve the oral health of the elderly to improve their quality of life.(32)

A need for improvement of the oral health status of the care home residents, and there must be preventive programs and awareness among the elderly people and the caregiver about the importance of the oral health, and the effects of the removal of dental plaque.(33) Researchers in Poland found that 59.8% of care home residents needed dental treatment but only 27% were aware of their need, whilst 75% of the residents had not seen a dentist for a year. The reasons for this were cited as no awareness of the needs, difficulties in organizing visits and few remaining teeth.(33)

Some residents needed assistance in cleaning and brushing their teeth or dentures. The oral care of elderly care home residents was considered as a health problem caused by poor organization, and no time for to oral hygiene. There must be an improvement in education and organization to provide more time for oral care.(33) The most important way to improve and oral health is to motivate the residents to clean as a daily basis, and to have an annual dental checkup.(33)

Another way to improve the oral health of elderly care home residents is to increase the awareness of oral health of care home managers, A barrier is the lack of an assessment form for oral health for the new residents.(34) That 61% of residential homes in Malta did not provide toothpaste and toothbrushes or any denture adhesives to the residents was regarded as terrible.(34) Some residents with few natural teeth or no denture were fed a soft diet to compensate for a lack of chewing ability.(34) There were no regular dental visits, and only if residents felt pain, would an emergency dental visit be arranged.(34) The caregiver in the residents home must have sufficient information and knowledge of oral health needs of the elderly.(34) There is a survey done in Washington for the nursing home residents to discover the dental problem and the dental needs for the elderly in the home residents.(35) In the U.S they have found 50-70 % of elderly needs dental care through the epidemiological studies done, patients with systematic disease and the medication prescribed for these conditions can also compromise the oral status.(35) Moreover, some of the elderly they cannot maintain the proper oral hygiene. The most problem found in this study are caries, poor oral hygiene, high rate of edentulism, gingivitis and periodontal disease. The elderly need assistance on their daily care, and due to the overload of the nursing staff in the home residents, and they do not have an idea about the proper oral hygiene technique, so they do not give a concern about the oral hygiene of the elderly home residents. The result of the study shows a majority of patients had denture only(35.2%) or a combination of natural teeth and dentures (42.3%) and less than 10% of the patients had no dentition.(35) 72.1% of poor oral hygiene due to lack of regular dental care, 43% for sore and bleeding gum, 36% of root caries, 26.3% coronal caries, 23.6% retained root tips. 18% tooth mobility and 7.6% toothache for the sample of 1063 residents which is reporting 39% of the total population.(35) Moreover, it examined the association between the oral health status and the environmental status such as the size of nursing homes, and they found that the residents in the large nursing home also exhibited poorer oral hygiene.(35) So they

conclude that the nursing home residents need more dental programs, the dentist and the hygienist must be involved and the nursing home also need to be trained and to provide the daily oral health maintenance in right technique.(35)

The UK Adult Dental Health Survey from 1998 reported that the number of people without teeth was only 4% of those sampled.(36) This percentage has decreased since the first survey was carried out in 1968 when 37% had no natural teeth. The majority 58% were edentate in the age group of 75 years and above and 87% of all adults had some natural teeth, although social class and the marital status can be factors that affect retention of natural teeth in older people.(36) The region in the UK with a high proportion of the population with some natural teeth was the South of England where 90% of the population was dentate. The reason behind this is the different social class structure of the regions and countries among the United Kingdom with greatest wealth in South of England.(36) This survey shows that tooth loss reduced in recent decades.(36)

In 1968 two thirds of people who had lost all of their teeth, had 12 or more teeth removed at their final clearance, 10 years later this had dropped to one half, by 1998 it was only one quarter. Factors which reduce the number of extracted teeth include a reduction the amount of oral disease and a greater determination among patients, and their dentist to retain natural teeth for as long as possible.(36) It was found that the most frequent causes for tooth loss were caries and gum disease. The proportion of people in the UK with no teeth at all is expected to drop from 8% in 2008 and to 5% by 2018. There will therefore be a small number of edentate people. In younger people the average number of teeth was 24.8, which reduced sharply among the elderly. A functional dentition is defined as having 20 or more teeth which is also a short dental arch as 10 occluding pairs was regarded by Kayser to be the minimal numbers for optimal function and esthetics.(36,37) So in this survey, it was suggested that people who lose the last of their teeth in later years may be

somewhat reluctant to do so. People who expect to lose their teeth were significantly less likely to be upset about the process than those for whom it was a surprise.(36)

The last UK Adult Dental Health Survey was done in 2009 and recorded significant oral conditions among British adults.(26) The prevalence of caries between 1998 and 2009 had fallen from 54% to 31%, but the number of teeth affected by caries did not change with a mean DMFS of 2.7 affected teeth per person.(26) Caries prevalence differed by age group, for example 36% of 25-34-year-olds were affected compared with 26% of 45-54-year olds and 22% of 65-74 year old. The prevalence of coronal caries in England fell from 46%to 28% between 1998 and 2009.(26) With older adults, 7% of dentate adults were affected by root caries because of more exposed root surface area which leads to higher prevalence and number of affected teeth, but the average number of teeth with active root caries was low.(26) Pocketing increased by age. Although older people have fewer teeth, the prevalence of pocketing was higher in men than women. Between 1998 and 2009 there was a mean increase of pocket probing depth of 6mm. Dentate adults with 21 teeth or more had a better quality of life compared to those with fewer teeth. This survey was done to gain baseline and comparative data on oral health of adults.(26)

Pengpid et al conducted a study in Indonesia on a sample of 7998 adults aged 50 years and older and reported that edentulism for women was 7.6% and for men it was 6.8%.(38) However, in males edentulism was associated with hypertension but there are no association with diabetes whilst in females edentulism was associated with functional disability.(38)

Almomani et al reported that edentulous care home residents in Jordan had more cognitive impairment than the dentate residents and the oral health status could be affected by the physical impairment.(39)

2.1 Caries in the elderly:

As the number of teeth retained by the elderly increases, the risk of dental caries increases due to risk factors such as xerostomia, diet, and poor oral hygiene which will affect the general health and the quality life of the elderly.(40)

There are reasons that can lead to development of dental caries in elderly, such as the use of medications which result in dry mouth, lack of preventive culture, iatrogenic factors and cognitive manual dexterity problems. Caries can present as a primary or secondary lesion, and the old age population has a high prevalence of coronal and root surface caries.(40) Primary caries presents on any tooth surface but is more commonly seen on cervical areas and root surfaces of older adults. Secondary caries is one of the main reasons to replace failed restorations, and older patients who experienced caries in the past may present with many restorations.(40) Root caries and caries on overdenture abutments, happens mostly in old age due to gingival margin recession, so the enamel cementum junction becomes exposed which is susceptible to bacterial retention and demineralization due to irregular surfaces so more caries can develop.(40) Overdenture therapy has a high risk of dental caries in the abutment teeth and thus this treatment may be regarded as transitional to complete dentures.

Saliva is important in protecting the hard and soft tissue and to maintain the balance of oral flora. 30% of the population aged 65 or over suffer from dry mouth which can result in dental caries. Furthermore, some drugs induce xerostomia such as tricyclic antidepressants, beta blockers, and antihistamines.(40) Some medication contains a high amount of sugar. It is essential to assess dietary sugar intake in the older adult which can lead to tooth decay and provide preventive treatment. The older adult may not know how to brush their teeth, so they need oral hygiene instruction and motivation and advice to use toothpaste with fluoride to promote remineralization

of initial caries. The past dental history will give an indication if the patient is in a high, medium or low risk for dental caries which will help formulate a treatment strategy for each patient.(40)

Assessment of caries in Australian nursing home residents found that there is a high level of coronal caries and root caries among the elderly if they stayed longer than 12 months in the nursing home compared to those who were recently admitted.(41) Most of the elderly needed assistance with brushing their teeth. Coronal caries occurred in 67.9 % of dentate residents, and for root caries the percentage was 77.6%.(41) The factors which were identified included having poor oral hygiene and cognitive impairment. They advised that residents in nursing homes need more assistance with oral hygiene and cleaning dentures because they are at high risk of dental disease. Also, these residents must have dental visits on a regular basis to avoid root and coronal caries.

Medical conditions such as Sjogren's syndrome, poly- pharmacy with a xerostomic side effect or radiation to the head and neck can result in a lower salivary flow rate which increases the risk of caries.(42) With age saliva flow reduces and some medications will affect salivary flow and cause dry mouth such as high blood pressure tablets, cholesterol, pain medication, muscle relaxants, allergy and asthma medication.(42) Frequency of sugar in the diet and the type of food the elderly eat increase root caries of elderly, and sticky food can stay longer on tooth surfaces and cause root caries.(42) The elderly with a systemic disease such as diabetes, or hypertension may have xerostomia leading to increase caries risk.(42)

2.2 Periodontitis in the elderly:

A US dental survey between 1971-1975 reported that 17% of older residents were edentulous, but this reduced to 5% from 2007-2008.(43) As the number of elderly is increasing retention of natural teeth increase the risk of periodontal disease.(44) Data collected from the Centers for Disease Control and Prevention shows that 65% of Americans aged 65 years and above have moderate to

severe periodontitis.(45) It is difficult to know and measure the previous periodontal disease for geriatric people.(44) Alternatively, older subjects often have gingival recession but no pocket formation.(44) Diet again can be one of the factors for gingival inflammation in the elderly because high sugar intake leads to more plaque accumulation which increases inflammation.(44)

Aging can affect the tissues of the periodontium and leads to changes in the cells of these tissues. For example the gingival tissue of elderly becomes thinner, less keratinized, has less collagen while the cementum appears thicker with age and the width of the periodontal ligament decreases with age.(46) Plaque control is essential before periodontal treatment starts, and oral hygiene instruction must be explained slowly to elderly residents.(46)

Elderly with periodontitis have impaired wound healing after surgery.(47) Periodontitis can be associated with many factors such as smoking tobacco and diabetes. (47)

2.3 Tooth wear in the elderly:

As populations live longer and retain more teeth, the number of cases of tooth wear will increase. Tooth wear is a condition that includes attrition, abrasion, and erosion and it is the most important to know the factors causing the tooth wear.(48) The prevalence of tooth wear in the UK study for young adults was reported the mean proportions of teeth with some moderate wear increased to 9% over 65 years of age and 2% with severe wear in older age.(49) Tooth wear is multifactorial, and includes attrition caused by tooth to tooth contact in bruxism (parafunctional habits), erosion caused by non-bacteriogenic intrinsic acids such as gastric acid (reflux) or extrinsic acid in soft drinks, citrus fruits and some medication such as vitamin C, and abrasion caused by toothbrush, pipe smoking and toothpick.(48) Management of tooth wear needs a diagnosis first. The dental history will help identify the causative factor. The dietary plan of each elderly resident will also help to prevent erosive tooth wear.(48) The first step of management is to stop the factors causing

tooth wear, and early diagnosis is helpful in early management and prevention of the problems. (48)

A study in northwest China measured tooth wear in 704 subjects aged 40-50 and assessed the factors associated with the wear using the Tooth Wear Index by Smith and Knight. (50) Teeth were divided into four groups incisors, canines, premolars and molars. Wear severity in incisors and canines was more than in the molar and premolar group in the maxilla and mandible but more wear occurred in molars than in premolars.(51) However, three factors were associated with the results including consuming hard and acidic food, bruxism during sleep and clicking of the temporomandibular joint.(51) The reasons for the greatest severity of tooth wear in incisors and canines were that: the incisors are smaller and have thinner enamel and are most often retained teeth in older people and are involved in masticatory function and excursive movement. Also, hard and acidic food is a major factor for tooth wear in northwest China.(51) Van't Spijker found that the percentage of adults with severe wear increased from 3% at the age of 20 years to 17% at the age of 70 years which indicates that tooth wear increases with age.(52)

Sun et al conducted a study in China to evaluate the epidemiology of tooth wear in Beijing.(53) They did a clinical examination used the BEWE and surveyed by questionnaire a total of 1821 subjects. (53) The BEWE score 2-3 was the most prevalent in all age groups with no significant difference between maxilla and mandible but tooth wear on incisal and occlusal surfaces was worse.(53) This was the same result as in northwest China in that incisors had the highest score of tooth wear then canines, molars and premolars. The 50-70 years age group had the highest prevalence of tooth wear in maxillary canines and mandibular premolars and showed the lowest prevalence of molar wear because of the high rate of tooth loss with age.(53) Xerostomia is one of the risk factors for tooth wear among the elderly due to the decrease in salivary flow.(53)

2.4 Demographic data on the UAE:

The UAE population in the year 2016 was 9,121,167 according to the administrative records dated 31 December 2016. It showed that 6,298,294 were male and 2,822,873 were female making the gender split in the UAE 69% male and 31% female as shown in the table 1.(54)

Table1: The of Population of the UAE by gender (2016) from The Federal Competitiveness and Statistics Authority

Female	Male	Total
2,822,873	6,298,294	9,121,167

The UAE population is 0.13% of the total world population and the median age in the UAE is 33.5 years.(55)

The elderly (60 years and older) made up about 1.6% of the population in the United Arab Emirates. It should be noted that the average annual growth of the elderly population (60 years or more) reached 4.5% during the period 1985-1995 while disability among the elderly amounted to 1.5 % of a total elderly population of about 41,346 in 1995.(54)

The UAE ministry of health and prevention has multiple initiative for the avail of senior people. One of these initiatives is to provoke a database to regulate the life expectancy of older persons in the country and expand the healthcare programmes and services especially home care services.(56) In the distance area of Fujairah and Ras AL Khaimah the ministry provides mobile clinic services. The services include medical care, rehabilitation, natural treatments, preventive measures, dental, optical dermatological and diabetes treatments. In Ras Al Khaimah the mobile clinic does not offer dental treatments.(56)

Ministry of Community Development provides primary healthcare and social, psychological and physical therapy to UAE nationals who are at least 60 years at the Elderly Care Center or through their home care programmer.(56) Red Crescent Authority offers Various Programmes for the elderly and coordinates with the elderly care centers across the country to organize various activities and events that draw attention to their home care programme.(56) Sheikh Khalifa Medical City in Abu Dhabi and AL Tawam hospital in Al Ain provides home care services to all UAE nationals. Abu Dhabi Rehabilitation Center is the only center that offer specialized care for the elderly in Abu Dhabi city. It admits senior Citizens who have no body to take care of them.(56) Community Development Authority runs Elderly Happiness and Home care (Waleef) initiatives that ensure rehabilitation, care and happiness of senior citizen. Dubai Health Authority provides home care services to both Emiratis and expatriate residents, also provides comprehensive geriatric assessment, nursing care, home safety evaluations, rehabilitation and nutrition assessment among others. But in Sharjah offer home care services which involves accompanying the elderly citizens to the hospitals and nursing them back to health.(56)

The family in the UAE continues to maintain bonds, love, respect and care despite the significant changes in the role and lifestyle of the UAE family.(54)

A study conducted in 2000 on the care of the elderly found that 99.5% of the elderly in the UAE lived with their families. It is interesting to note that the majority of elderly residents in nursing homes require nursing services that are not available from their family.

The UAE has provided all types of mental, nursing, social and psychological services through 17 centers and nursing homes spread throughout the country, including 5 roles Specialized for the care of the elderly and 12 hospitals serving about 275 older residents (2000 data). The first home for the elderly in the UAE opened in 1982 and the government bears the financial cost through funding from the Ministry of Health.(54)

Non-governmental organizations make a modest contribution, through volunteering for schemes for elderly people in care centers. Equipment is available for rehabilitation (35%) of the elderly living in nursing homes and especially for stroke, after care. The need for some to be cared in nursing homes is greatest for some poorer families, the UAE provides financial support. The UAE seeks to establish the principle of compassion and care for the elderly within families and considers this a duty of all Emirati families.(54)

Table 2 shows the increase in the UAE population by age and gender from 1975-2005.

Table 2: the UAE Population by age and gender data from the Censuses 1975-2005

	1975			1980			1985			1995			2005		
Age Group	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
0-4	34298	32996	67294	71148	67389	138537	96681	92464	189145	109524	103525	213049	145601	136538	282139
5-9	27281	25604	52885	49776	47077	96853	79668	75182	154850	112984	106307	219291	139929	129453	269382
10-14	20501	16550	37051	33238	29305	62543	50439	46241	96680	104885	97169	202054	130778	118279	249057
15-19	25935	14783	40718	32006	25353	57359	38762	34514	73276	83438	75471	158909	121388	110838	232226
20-24	57563	15629	73192	91096	35204	126300	75667	47325	122992	139868	77882	217750	272036	161530	433566
25-29	71323	17004	88327	143871	37977	181848	144548	58178	202726	238104	88409	326513	483657	178137	661794
30-34	48085	11447	59532	112616	25272	137888	141201	44659	185860	229066	80213	309279	489879	150482	640361
35-39	36573	100120	46693	74433	17724	92157	111934	31460	143394	219961	68740	288701	386762	113844	500606
40-44	23668	6614	30282	48329	10874	59203	66446	17057	83503	161583	41646	203229	262718	78543	341261
45-49	14949	5128	20077	27923	7756	35679	42979	11868	54847	106166	25850	132016	174459	51311	225770
50-54	10130	4864	14994	16140	6219	22359	21951	7811	29762	51655	13694	65349	107339	31539	138878
55-59	4555	2585	7140	7114	3327	10441	10557	4952	15509	25046	8344	33390	51303	15804	67107
60-64	4804	3091	7895	4699	3189	7888	5542	4083	9625	10407	5553	15960	18820	8527	27347
65-69	2566	1538	4104	3167	2159	5326	3718	2988	6706	6492	4597	11089	9172	5285	14457
70-74	2007	1729	3736	2220	1762	3982	2678	2305	4983	3651	3180	6831	5391	4013	9404
75-79	705	630	1335	835	665	1500	1149	995	2144	1649	1460	3109	2440	1837	4277
80+	1484	1148	2632	1101	1135	2236	1680	1621	3301	2325	2197	4522	4469	4326	8795
total	386427	171460	557887	719712	322387	1042099	895600	483703	1379303	1606804	804237	2411041	2806141	1300286	4106427

Table 3: Emirati population (excluding expats) by Emirates in the UAE and genders. Data from National Bureau of statistics dated 2010.

Emirate	Male	Female	Total
Abu Dhabi	204,108	200,438	404,546
Dubai	84,245	83,784	168,029
Sharjah	78,818	74,547	153,365
Ajman	21,600	20,586	42,186
Umm Al-Quwain	8,671	8,811	17,482
Ras AL-Khaimah	49,181	48,348	97,529
Fujairah	32,486	32,374	64,860
Total	479,109	468,888	947,997

There are more males than females in each Emirate and Abu Dhabi had the largest number of the Emirati population.

3. AIM:

This study aimed to determine the oral health status of residents and day stay attendees at care homes in the UAE using a modified WHO adult oral health survey.

3.1 Specific Objectives:

1. To identify the types of medical problems present in those examined and their impact on dental health.

2. To provide data on dental treatment needs among elderly people in care homes.

4. Materials and Methods:

4.1 WHO Assessment:

The World Health Organization (WHO) has published guidance on epidemiological surveys and methodology in oral health. The WHO has measured oral disease in different countries around the world. (57) And helps to collect data in an organized and standardized method in order to compare between countries.(57) WHO surveys assess the oral status of population samples and develops programs for the improvement of oral health. The WHO recommends having oral health surveys every five to six years for the same community.(57) The data collected and analyzed helps health authorities and health providers identify risk factors and control diseases by developing policies and providing preventive programs. The clinical data collected by the WHO includes oral mucosal lesions, dental caries, fluorosis, prosthetic status, periodontal status, tooth wear, and general demographic information about the participants.(57)

The WHO oral health assessment form for adults (2013) was used for this study with minor modifications. The general information included, the date of examination, the Emirate, age and the gender, the medical history and any medication, and the ASA classification. The oral examination included oral mucosa status, periodontal status, tooth wear, dental status, fluorosis and prosthetic status. This WHO form was used for the clinical examination, however, the examiners also used, a consent form in Arabic and English. Medical history, medication, last dental visit, pain, prostheses, smoking habits, cleaning methods, frequency of cleaning, level of education were collected by the examiners.

The modified World Health Organization (WHO) form was used for the oral health survey. This included collecting information on coronal caries (DMFT) and root caries, periodontal status (Community Periodontal Index, CPI), mucosal status, tooth wear and prosthetic status. An explorer was used for caries diagnosis without applying pressure in dental fissures and surfaces according to WHO criteria. Visual examination for cavitation was the criterion for caries lesion determination as per WHO guideline and early enamel or white spot lesions were not identified. Radiographs were not taken.(57) Existing restorations were recorded within DMFT but the reasons for 'M,' missing teeth in DMFT, was not known since initial data was absent. The CPI was used to assess periodontal disease. The 10 index teeth were 17,16,11,26,27,37,36,31,46,47. Each sextant with at least two functional teeth were coded and the worst affected site in the sextant was recorded. Tooth wear was assessed on a 3-point scale code (0) no sign of wear, code (1) enamel wear, code (2) dentine exposed, code (3) pulp involvement. Denture wearing was assessed by coding (0) no denture (1) partial denture (2) complete denture. Also, the presence of any implants and fluorosis was recorded. The clinical examination of ambulatory subjects took place in a normal chair while the infirm elderly was examined in a wheelchair or bed. The American Society of Anesthesiologists ASA classification system was used to code physical status. The codes are: (1) healthy patient; (2) mild systemic disease; (3) severe systemic disease; (4) severe systemic disease that is a threat to life.

4.2 Training and Calibration of Examiners:

Five prosthodontist postgraduate students from Hamdan Bin Mohammed College of Dental Medicine (HBMCDM) collected the data. The examiners were trained in the requirements of the consent, clinical criteria, data entry and questionnaire. The examiners were calibrated in Hamdan bin Mohammed Dental College by examining 5 people with similar characteristics to the study

group. Each of the 5 patients was examined twice with an average of 7-10 days between appointments. As the final number of participants was not known, the sample size for training could not be determined prior to the start of the study.

At any one visit, only three dentists examined subjects whilst the other two dentists completed data collection forms (questionnaires). Five dentists had training and calibration but only 3 were involved in actual examination as 2 dentists acted as reserves.

Kappa test done with inter and intra calibration done by entering the data which was collected in SPSS, a mean inter- examiner Kappa of 0.6 was achieved.

The 5 patients were examined in the prosthodontic clinic using the same instruments as in the field such as the torch light and disposable examination kit. The standard infection control protocol was applied, and dental assistants helped to record the data.

4.3 Selection of Care Homes:

There is no precise data about the number of care homes in the U.A.E as families care of for their sick and elderly. There are some care homes in the U.A.E. but none were identified in Fujairah and Ras Al-Khaimah.

An internet search failed to find any private care homes, but private companies provide trained nurses and equipment for families to take care of their old and infirm relatives. Selection of the care homes was a problem because there is no register of care homes. Internet searches and contact with Ministry Of community Development was undertaken.

Table 4: The centers in each emirate

Name of Care home	Emirates	Date
Older Persons Care Center	Ajman	14/2/2017
Older People's Home	Sharjah	19/12/2017
Family Gathering Center	Dubai	20/3/2018
AlMudeef Center	Abu Dhabi	11/7/2018

Table 4 shows the name, emirate and date each care home was visited.

4.4 Study design:

Across-sectional epidemiological study was used to determine the oral health status of residents and attendees during 2017 and early 2018 in all care homes in the UAE.

4.4.1 Sample size:

All care home residents and the day care visiting elderly will undergo a dental examination and form the study sample.

4.5 Inclusion and exclusion criteria:

4.5.1 Inclusion Criteria:

All residents and day visitors within the age range of 45-64 years (pre-senior) and 65 years and above (senior) will be included and the handicap patients few of them who are in the care homes. The study will include both residents with or without capacity but only if consent is gained from their guardian/care home manager.

4.5.2 Exclusion Criteria:

Care home residents and day care visitors were all included apart from those who do not wish to participate in the study. Participants will be free to withdraw from data collection at any point.

4.6 Instruments and consent for examination:

The examination followed the universal standard cross infection control protocol. All instruments were disposable (sterile i-Pak®, AD Surgical), containing one disposable double ended dental explorer with periodontal probe and one disposable anti-fog coated dental mirror. The periodontal probe differed from the WHO perio probe with 3-6-9 mm markings rather than a black band between 3.5 and 5.5mm. The periodontal probing depths on participants were estimated to the WHO readings. A Geepas rechargeable LED torch was used. Consent forms were printed in 2 versions but most of the elderly were Arabic speaking. All instruments were placed in the sharps box after use.

4.7 The examination:

The data from the screening examination was recorded on a modified WHO form.

The visit was arranged by contacting the home to arrange a full day visit from 9 am until 2 pm. Four centers were visited in four emirates, Ajman, Sharjah, Dubai and Abu Dhabi. Examples of the Questionnaire, the modified WHO form and the consent form are shown in Appendix 1,2 and 3.

4.8 Statistical analysis methods:

The data will be analyzed by using SPSS version 20.0 statistical package program. Descriptive statistics will be used to describe categorical and continuous variables. Chi-square and Exact Fischer test (when appropriate) will be used to test the association between two categorical variables. T-test will be used to compare continuous variables between two groups. A P-value of less than 0.05 will be considered significant in all statistical analyses.

4.9 Ethical consideration:

Consents was formed in English and Arabic version and all participants who are voluntary signed the consents by them self and the participants who are not eligible to sign their family member or the guardian signed the consents for them. The confidentiality of research records was maintained, participants examination records was completely anonymous and only the researcher had access to the data. The confidentiality of individual information will be maintained in any publications or presentations regarding this study. (Appendix 1)

4.10 Institutional ethical clearance:

The research study was approved by the research and Ethics Committee of the Hamdan Bin Mohammed Collage of Dental Medicine, MBRU. (Appendix 4)

5. RESULTS:

The total number of residents and attendees examined was 107. The overall mean age for all 107 participants was 67.5 years, with the youngest being 25 years and the eldest 96 years old. The modal value was 82years (N=6). The mean age of males and females is shown in table 5 with no difference for age by genders.

Table 5: Mean Age by Gender

Gender		N	Mean	St. Deviation
Age in years	Male	57	69.2	16.3
	Female	50	65.5	14.8

t- test, NSS

Table 5 shows the mean age in years by gender. Males were slightly older, but this was not significantly different to females.

Table 6: Participant location by Emirate

Emirate	Number examined	Percent
Abu Dhabi	13	12.1
Dubai	32	29.9
Sharjah	37	34.6
Ajman	25	23.4
Total	107	100.0

Table 6 shows that most of the participants were from Sharjah.

Table 7: Participant's ASA Classification

ASA Classification	Frequency	Percent
Healthy	**8**	**7.5**
Mild systemic disease	**70**	**65.4**
Severe systemic disease	**25**	**23.4**
Severe life-threatening systemic disease	**1**	**.9**
Declined	**3**	**2.8**
Total	**107**	**100.0**

Table 7 shows most of the participants had mild systemic disease according to the ASA Classification. Examples of mild systemic disease included Type 2 diabetes (NIDDM)and hypertension.

Table 8: Ambulatory status.

Status	Frequency	Percent
Ambulatory	**43**	**40.2**
Wheelchair	**36**	**33.6**
Bedridden	**21**	**19.6**
Did not participate	**7**	**6.5**
Total	**107**	**100.0**

The ambulatory status of the participants is shown in table 8. Most were ambulatory, and these participants were day stay attendees at the respective centers. Seven participants declined to be examined and would not cooperate.

Table 9: Frequency of Medical Conditions (WHO classification)

Medical Conditions	Frequency	Percent
No medical Problem	**9**	**8.4**
Multiple conditions	**28**	**26.2**
Neoplasms	**1**	**.9**
Endocrine(diabetes)	**26**	**24.3**
Mental health problem	**20**	**18.7**
Stroke/nervous system	**6**	**5.6**
Circulatory system	**9**	**8.4**
Respiratory disease	**1**	**.9**
Musculoskeletal	**2**	**1.9**
Post RTA paraplegia/brain damage/stroke	**2**	**1.9**
Declined	**3**	**2.8**
Total	**107**	**100.0**

The type of medical conditions diagnosed in the participants is shown in table 9. The most frequent category was multiple conditions, followed by endocrine diseases. The medical history was gained from the attending nurse or the medical records.

Table 10: Dentate Status

Dentate status	Frequency	Percent
Edentate	**26**	**24.3**
Dentate	**61**	**57.0**
Edentate upper	**6**	**5.6**
Edentate lower	**2**	**1.9**
Declined	**12**	**11.2**
Total	**107**	**100.0**

Most of the participants were dentate (57%). The upper (maxillary) arch was edentulous in 5.6% of participants but these subjects had some lower teeth as shown in table 10. Only 2 participants had an edentulous mandible (1.9%).

Table 11: Periodontal status as determined by highest BPE/CPITN Score

CPITN Score	Frequency	Percent
No disease	10	9.3
Bleeding on probing	4	3.7
Calculus & other retentive factors	36	33.6
Shallow Pockets between 3.5 and 5.5mm	18	16.8
Edentate	26	24.3
Un-cooperative/declined	13	12.1
Total	107	100.0

The highest equivalent BPE score was 3 in any one subject indicative of probing depth between 3.5 and 5.5mm. No participant had a score 4. Many subjects had some degree of periodontal problem despite 24% being edentulous. Scores 1, 2 and 3 combined in a total of 58 subjects with only 10 (9.3%) having periodontal health shown in table 11.

Table 12: Tooth Wear

Tooth wear	Frequency	Percent
No wear	26	24.3
Enamel wear	12	11.2
Dentine exposed	30	28.0
Pulpal involvement	1	.9
Edentate	26	24.3
Un co-operative	12	11.2
Total	107	100.0

Marked tooth wear evidenced by dentine or pulp exposure was present in 31 subjects (29%) as shown in table 12.

Table 13: Fluorosis

Fluorosis	Frequency	Percent
No Fluorosis	58	54.2
Fluorosis present	11	10.3
Edentate	26	24.3
Un-cooperative	12	11.2
Total	107	100.0

Fluorosis was not very prevalent in the participants (10%) as shown in table 13.

Table 14: Mean DMFT for all Participants

	N	Mean	St. Deviation	Minimum	Maximum
DMFT	95	23.24	8.98	4.00	32.00

Table 15: Mean DMFT by gender

Gender	N	Mean	Std. Deviation	St. Error Mean
DMFT Male	49	26.5	7.2	1.02
DMFT Female	46	19.8	9.4	1.39

The mean DMFT was 23.2 for all participants as shown in table 14 but the mean DMFT by gender is shown in table 15. Males had significantly higher mean DMFT at 26.5 compared to females with 19.8 (p=0.01).

Table 16: Presence of Pain/Soreness by Gender

Gender	No Pain	Pain	Total
Male	**44**	**8**	**52**
Female	**26**	**10**	**36**
Total	**70**	**18**	**88**

Table 16 shown pain or soreness experienced by participants at the time of examination. Nineteen subjects were excluded because of non-cooperation and therefore 88 subjects were included in the 2X2 contingency table. There was no significant difference in the pain experienced between male and female subjects. (x^2= 2.008, p>0.02, NSS). 18 participants had some pain or soreness at the time of examination.

Table 17: How often do you clean your teeth/denture

	Frequency	Percent
Never	**5**	**4.7**
2-3 x a month	**3**	**2.8**
Once a day	**29**	**27.1**
Twice or more a day	**65**	**60.7**
Declined	**4**	**3.7**
No information	**1**	**.9**
Total	**107**	**100.0**

Table 18: Methods of cleaning teeth

	Frequency	Percent
Not cleaned	**2**	**1.9**
Toothbrush	**62**	**57.9**
Miswak	**1**	**.9**
Other sponge	**36**	**33.6**
No information	**2**	**1.9**
Declined	**4**	**3.7**
Total	**107**	**100.0**

Table 19: Methods of cleaning teeth by dentate status

	Use the following to clean your teeth					
	Not cleaned	**Toothbrush**	**Miswak**	**Other sponge**	**Declined/ unknown**	**Total**
Edentate	**0**	**6**	**0**	**19**	**1**	**26**
Dentate	**1**	**47**	**1**	**11**	**1**	**61**
Edentate upper	**1**	**4**	**0**	**1**	**0**	**6**
Edentate lower	**0**	**1**	**0**	**1**	**0**	**2**
Declined	**0**	**4**	**0**	**4**	**4**	**12**
Total	**2**	**62**	**1**	**36**	**6**	**107**

Tables 17 and 18 show the oral hygiene habits of the participants. Most of the participants brushed their teeth at least once a day (N=94) and used a toothbrush or other method. To determine oral hygiene methods by dentate status, a crosstabulation was carried out as shown in Table 19. Other methods of cleaning, for example sponge swab, was used in the edentulous participants.

Table 20: Linear regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.480[a]	.231	.205	8.00799

Table 20 shows that 23% of the variance of DMFT is accounted for by the model.

Table 21: Linear regression model with DMFT as the dependent variable and ASA, age and educational attainment as predictor variables.

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.091	5.761		.363	.717
ASA classification	2.229	1.482	.143	1.504	.136
Age in years	.261	.058	.430	4.466	.000
What level of education completed?	-.941	.498	-.178	-1.891	.062

The most important predictor of caries experience expressed as the DMFT was age whilst educational attainment was inversely related and less significant. (Table 21) The inverse relationship between education and DMFT is to be expected as lower educational attainment and higher DMFT is understandable. The ASA classification of mild, sever and life threatening was not associated with DMFT.

6. DISCUSSION:

The total number of participants in this study was 107 which represented a mere 0.01% of the total Emirati population as shown in table 3. The data from table 3 is dated 2010 which is relatively old. This is the first study across 4 Emirates in the UAE to try and identify the dental status of residents and day stay attendees at care homes.

The purpose of this study was to describe the oral health status of residents and day visit attendees at care homes in the UAE. There is no data or information about residents and day visit attendee's oral health status, and dental services were not provided to these participants at the care homes in the UAE. If the participants had any oral health problems, then the care homes would send the residents to the nearest primary health care center.

Our results show that the most medical problem among the residents and the attendees in care homes was diabetes and hypertension which reflects disease patterns in the UAE and Gulf countries. 24% of participants were edentulous which may be related to periodontal disease which in turn has a bi-directional relationship with diabetes.

The mean DMFT in males was significantly higher than in females probably because females are more concerned about taking care of themselves than males.

It is of concern that 18 participants were suffering with pain or soreness at the time of examination. A recommendation should be that dental visits to care centers are advertised in advance so that day attendees are aware that a dental examination is planned. Treatment should be arranged through the dental centers in local clinics.

Education was one factor to also affect the oral health status of residents and day visit attendees with higher education reducing DMFT significantly. There was no information about the oral health status of the residents on entering the care homes with emphasis on the medical condition

only. Nurses in the care homes payed more attention and concern to the medical conditions of the residents than dental or oral status.

In Brazil, Hugo et al. reported that elderly people assessed their OHRQoL negatively if they had fewer than 20 teeth.(23) In this study there was no assessment done for the oral health related to quality of life but participants had a high number of decayed, missing and filled teeth so it is essential to have an assessment of oral health to improve quality of life for this group of people.

The ADHS (2009) reported that 30% of 75-84 years old, and 47% aged 85 years and above were edentulous in a sample where 51% were male, and 59% were female among care home residents.(26) In this study 24% were edentate but participants were younger than in the UK.

Multiple medical problems were common, followed by endocrine disease and mental health problems. While circulatory disease was present in 9 participants and stroke or nervous system problems was present in 6 participants. Such medical problems can affect speech, eating and social interaction of elderly although this was not assessed in this study. The medication prescribed to elderly could also lead to oral health problems. The numbers for 'unknown' and 'declined' vary because different variables had varying participants' agreement to co-operate or there was no information.

The Florida study found a high percentage of residents with calculus (79.6%) indicating lack of proper oral hygiene and possibly a lack of training or lack of time for oral hygiene.(30) This study found a high percentage of residents with calculus (34%) due to no oral health assessment done by the care provider and no dental protocol for the elderly at the care homes.

The prevalence of caries between 1998 and 2009 in the UK Adult Dental Health Survey fell from 54% to 31%, but the number of teeth affected by caries did not change with a mean DMFS of 2.7 affected teeth per person.(26) Not same as what found in this study about the DMFT with the mean of 23.24 and the male DMFT was higher than female which highly significant (p=0.01).

Age was predictor of DMFT which was not surprising but interestingly ASA was not a predictor. Since the mean age of the participants was 67.5 years it may be that the medical conditions developed later in the life with less influence on dental status. In other words caries and restorations had already developed or been placed by the time the medical condition developed later on.

7. STUDY LIMITATIONS:

The limitations in this study are as follows:

1. The limited number of care homes in UAE resulted in a limited number of participants.
2. There is no registration of care homes in the UAE making subsequent data collection difficult and possibly not representative.
3. There is no up to date information about the total number of older subjects in UAE.
4. There is no data about private care homes in the UAE.
5. There are no data about oral health assessment in care homes in the UAE.

8. CONCLUSIONS:

Within the limitations of this study, the following conclusion can be drawn:

The oral health of day stay attendees and residents in care home was poor as the mean DMFT was 23.2 which is high. The DMFT in males was significantly higher than in females. 34% of participants had calculus on their teeth which indicates that there was ineffective oral hygiene for these subjects and they need help in providing daily hygiene. 18 participants complained of pain and soreness on the day of examination.

8.1 Study Recommendations:

1. To have dental guidelines and protocol for the dental care of the elderly at care homes.

2. To train specialists in gerodontology.

3. To provide programs and events about oral health and hygiene and the importance of oral health for general health.

4. To have an annual dental check up with mobile dental clinic for the bedridden elderly.

5. All nurses and care providers must have time to provide oral hygiene for the patients who are not able to do the cleaning by themselves.

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APPENDICES

APPENDIX 1

CONSENT TO TAKE PART IN A DENTAL EXAMINATION

The dental examination is part of a survey of the dental status of care home residents and day stay visitors taking place in the UAE by dentists from the Hamdan Bin Mohammed College of Dental Medicine.

The dentists will examine your mouth and teeth in the standard manner.

The dental examination takes approximately 10 minutes and is just like a check-up.

All the information is strictly confidential and individual data will not be disclosed.

The research data gained from the dental examinations will be pooled to improve future dental services for care home residents.

Your participation is voluntary, and you can withdraw at any time.

Any questions should be answered before participating in this dental examination.

Signature……Date……

Signature of examiner……..... ...Date……

الموافقة على المشاركة في فحص الأسنان

فحص الأسنان هو جزء من دراسة لحالة الأسنان لسكان دار الرعاية المسنين التي تشهدها دولة الإمارات العربية المتحدة من قبل أطباء الأسنان من كلية حمدان بن محمد لطب الأسنان.

أطباء الاسنان سيقومون بفحص شامل للفم و الأسنان بالطريقة الصحيحة والمألوفه.

سيأخذ فحص الأسنان ما يقارب عشر دقائق تقريبا, و سيكون الفحص شامل لكل الاسنان.

جميع المعلومات ستأخذ بسرية تامة و لن يتم الاطلاع على البيانات الشخصية للمريض.

نتائج البحث المكتسبة من فحص الاسنان ستعطى فكرة شاملة عن احتياجات كبار السن في دار رعاية المسنين و سوف تساعد في تحسين خدمات طب الأسنان في المستقبل.

مشاركتكم اختياريه و يمكنكم الإنسحاب في أي وقت شئتم.

ينبغي الإجابة على أية أسئلة قبل المشاركة في فصح الاسنان.

التوقيع: ..... التاريخ: .....

توقيع طبيب الأسنان: ..... التاريخ: .....

APPENDIX 2

1- Medical condition:_____

_____

2- Medication: _____

_____

3- Over the past 6 months, did you have any pain or discomfort in your teeth or mouth?

(……) No (……) Yes

(……) Don't Know (……) No answer

4- Do you have any removable prostheses?

(……) No (……) Yes, not used (……) Yes, and used

5- Do you smoke?

(……) No (……) Yes

6- How often do you clean your teeth/ denture?

(……) Never

(……) once a month

(……)2-3 times a month

(……) once a week

(……)2-6 times a week

(……) once a day

(……) twice or more a day

7- Do you use any of the following to clean your teeth?

(……) Toothbrush

(……) Wooden toothpicks

(……) Plastic toothpicks

(……) Dental floss

(……) Charcoal

(……) Miswak

(……) other Please specify…….

8- What level of education have you completed?

(……) No formal schooling

(……) less than primary school

(……) Primary school completed

(……) secondary school completed

(……) High school completed

(……) College/University completed.

9-Are you currently experiencing dental pain/oral soreness?

(……) No

(……) Yes

APPENDIX 3

MODIFIED WHO DENTAL ASSESSMENT FORM

ID# (DDC No): ☐☐☐☐

Date: Day ☐☐ Month ☐☐ Year ☐☐

Emirate: ☐

1= Abu Dhabi 2= Dubai 3= Sharjah 4= Ajman 5= Um AL Quwain 6= Ras al Khaimah 7=Fujairah

Examiner number: ☐☐

General information:

Age: ☐☐

Gender: ☐

1= Male 2=Female

ASA PS Classification: ☐

1= Healthy patient 2= Mild systemic disease 3= Severe systemic disease 4= Severe systemic disease that is a threat to life.

Status: ☐

1=Ambulatory 2=Wheelchair 3= Bedridden

Oral Mucosal Status:

Oral Mucosal: ☐

0= Normal 1= Abnormal

Periodontal Status:

CPITN :

17/16	11	26/27
☐	☐	☐
☐	☐	☐
47/46	31	36/37

0 = No disease (no gingival pockets < 3)
1= Bleeding on probing (no gingival pockets < 3)
2= No periodontal pocketing < 3 mm,
but calculus present with or without plaque retentive factors
3= Shallow periodontal pockets 4-5 mm
4= Deep periodontal pockets > 6mm

Tooth Wear:

Severity

0= No sign of wear

1= Enamel wear

2= Dentin exposed

3= Pulpal involvement

Dental Status:

0= Sound 1= Coronal caries 2= Root caries 3= Filled w/caries 4 = Filled no caries 5= Missing

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28

48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

Fluorosis:

0= No 1= Yes

Prosthetic status:

0= No denture 1= Partial denture 2= Complete denture

Upper jaw	Lower Jaw

Presence of implant:

0= No 1= Yes

APPENDIX 4

Date: 11/03/2017

Dear Dr Banaan Almazrooei Prosthodontic Resident

Re: Your research protocol

Titled: Oral health status of elder people in UAE care homes

Thank you for submitting your research protocol to the Research and Ethics committee of the Hamdan Bin Mohammed College of Dental Medicine, MBRU.

It was considered at the meeting held on: 05/03/2017

It was agreed to approve the protocol pending minor revision which you have now carried out.

Please make sure you see your research supervisor regularly during the project in order to maintain close collaboration and support. The committee would like to remind you that it is a requirement of the programme that you complete a research dissertation, which comprises 15% of credits within the 3-year MSc programme.

The committee wishes you every success with your study

Yours sincerely,

Prof A Milosevic

Chair, Research and Ethics Committee, HBMCDM