



Oral Health Status Among Elderly Population in Thimphu City, Bhutan-2022

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Sonam Ngedup and Dorji Phurpa.**Abstract****Background:** Oral health is a fundamental component of general health and well-being. As individuals become older, their oral health conditions and needs become more complex and multifaceted due to physiological changes with possible influences from personal habits and their surroundings.**Aim and Objectives:** This study aimed to determine the oral health status among the elderly population that determines oral-related diseases and some factors for the same.**Methods and Materials:** The data for this study was retrieved from the screening program conducted at Changlingmethang Park in Thimphu in 2022. The modified Kayser-Jones – Elderly Oral Health Assessment form was used for the clinical assessments. Information on sociodemographic, dental caries, periodontal diseases and oral mucosal conditions, edentulism and use of dental prostheses were recorded.**Result:** Among the 276 elderly participants, age groups 65 -74 years had the highest representation. The subjects decreased with an increase in age. More than 55% of the elderly had decayed teeth and nearly 60% with periodontal diseases. More than 83% of the elderly had > 1 missing teeth (nearly 39% with 12 or more pairs of functional teeth). Females had fewer prosthetic devices for lost teeth. The participants who needed extraction, filling and oral prophylaxis comprised greater than 68%. Overall, males exhibited poorer oral health than females.**Conclusion:** The elderly in Thimphu city presented with a high prevalence of dental caries and less functional teeth with fewer subjects using prosthetic appliances. A very significant finding among the majority was low oral health awareness.**Keywords:** Dental Caries; Dental Prosthesis; Elderly; Oral Health; Oral Hygiene; Periodontal Diseases**Introduction**

Oral health is a fundamental component of general health and well-being [1]. As individuals become older, their oral health status and needs become more complex and multifaceted due to a multitude of physiological changes in the body system impacted diversely by the surrounding habitats and influences. The elderly

are often defined as individuals aged 65 years and older, and represents a growing section of the population in almost all countries. This small effort in gathering data of the elderly explores the significance of maintaining oral health in older adults, highlighting the challenges they go through and emphasizes the importance of integrating oral health into general health care for this vulnerable group of population [2,3].

The governing health body of the world recently disseminated alarming dental statistics with 1 among 4 adults (26%) in the United States having untreated dental cavities which was corroborated by the Centers for Disease Control and Prevention. Worldwide, untreated cavities are a more common oral health problem, affecting more than 2 billion people and nearly half of world's population with untreated oral diseases in different forms [4-6].

Literatures suggest that as many as 78% of the elderly population have edentulism which lowers intake of fruits and vegetables; and consume large quantity of soft diets that are rich in saturated fats and cholesterol leading to the development of hypertension and diabetes. Among the elderly, the most frequently encountered oral-related diseases like dental caries, periodontal diseases, edentulism, oral mucosal lesions, oral infection, and temporomandibular disorders (TMDs) leading to chewing problems and a reduction in social interactions. Loss of functional teeth for mastication (chewing) and compromised oral health have been associated with nutritional deficiencies leading to compromised immunity with loss of body weight and susceptibility to diseases easily [7,8].

Elderly people have dryness of mouth (xerostomia) due to reduced saliva flow which makes them more susceptible to dental caries and burning mouth syndromes. Multiple drug consumption has other side effects that could affect periodontium and related diseases including cardiovascular and cerebral diseases [8,9].

Given these reasons, healthcare providers and government organizations need to address the problems related to dental pathology and oral health conditions among the elderly to improve the quality of life of these individuals [9]. Nevertheless, such evidence related to oral health among the elderly in the Bhutanese population is limited. Therefore, the need for such a study became pertinent.

In Bhutan, the Elderly Screening Program is conducted by the Ministry of Health every year. This program covers elderly people 65 years and above with oral examination, oral health education, other health-related instructions, general health examination, instant medication and a health interview questionnaire [10]. Even though evaluations of the efficacy of elderly screening program have been attempted, there is little convincing evidence that oral health screening program play an important role in detecting dental caries and periodontal disease in elderly people and the ability of oral health-screening program to reduce the morbidity or mortality from oral diseases. To gather evidence for how this screening program affects its intended recipients, authentic data from well-designed studies are needed.

Aim and objectives

The purpose of this study was to conclude the oral health status among the elderly population to determine oral-related diseases that might affect the quality of life and provide health education and instructions to improve the quality of life of this population.

Methods and Materials

Thimphu, the capital city of Bhutan has a total population of 114,551 which accounts 17 percent of country's population and 41 percent of urban centers, that translates to 4090 elderly (65 years and above), 1839 males and 2215 females [10]. The screening program was implemented to reduce morbidity/ mortality from disease including oral among the elderly.

The data for this study was retrieved from the program which was conducted from 17th to 22nd. October 2022 at Changlingmethang Park in the capital city by a pair: a Dentist assisted by a Dental Hygienist from the JDWNRH. A total of 276 elderly participated in this screening program. The modified Kayser-Jones – Elderly Oral Health Assessment form (EOHAF) [11] was used for the clinical assessments during data collection. Variables included age, sex, contact numbers, clinical status like dental caries, signs and symptoms of periodontal diseases and oral mucosal conditions. Evidence for edentulism and wearing of dentures among participants was also collected.

Data Analysis

Epidata analysis classic software V3.2.0.0 was used to analyze the retrieved information depending on the variables. Mouth diseases like dental caries, periodontal diseases, oral mucosal conditions, and other characteristics were described in percentages and frequencies. The chi-square test was used to determine statistical significance [12]. The level of significance was set at $P < 0.05$.

Results

The participants' demographic characteristics are shown in table 1. A total of 276 elderly participated in the screening program. There was a preponderance of female subjects compared to males less than 45%. The groups, 65 -74 years were the highest among participants. The number of subjects decreased with an increase in age.

More than 55% of the elderly had decayed teeth and about 60% with periodontal diseases. Female participants were affected more than their counterparts in both diseases (Table 2).

Table 1: Demographic characteristics of the elderly participants (n = 276).

Variable	n	%
Total participants (N)	276	100.0
Sex		
Male	123	44.6
Female	153	55.4
Age		
65-74 years	199	72.1
75-84 years	65	23.6
85 years and above	12	4.3

Table 2: Oral health status among 276 study participants.

Variables	n (%)	Male (%)	Female (%)
<i>Dental Caries</i>			
No decays (sound)	105(38.0)	50 (47.6)	55 (52.4)
1-3 decayed teeth	60(21.7)	26 (43.3)	34 (56.7)
4 or more decayed teeth	111 (40.3)	47 (42.3)	64 (57.7)
<i>Periodontal diseases</i>			
Healthy periodontium	190 (68.8)	85 (44.7)	105 (55.3)
Gingivitis	38 (13.8)	19 (50.0)	19 (50.0)
Periodontitis	48 (17.4)	19 (39.6)	29 (60.4)

Table 3: Oral mucosal/soft tissues conditions among participants, 2022.

Variable	N = 276	
	n	%
Lips		
Presenting as smooth, pink, moist	267	96.7
Dry, chapped, or red at corners of mouth	4	1.4
White or red patch, bleeding or ulcer for 2 weeks	5	1.8
Lymph nodes		
No enlargement	271	98.2
Enlarged, not tender	5	1.8
Tongue		
Pink, and moist	232	84.1
Coated, patchy or some redness	7	2.5
Smooth, with red/white or red patch; ulcer for 2 weeks	2	0.7
Patchy (Geographic tongue)	2	0.7
Fissured tongue	30	10.9
Growth	3	1.1
Tissue inside the Cheek, floor, and roof of the mouth		
Pink and Moist	269	97.5
Dry, shiny, rough red, or swollen	2	0.7
White or red patch, bleeding, hardness/OSMF; ulcer for 2 weeks	5	1.8
Saliva (effect on tissue)		
Saliva free flowing and watery; tissues moist	270	97.8
Tissues dry and sticky	6	2.2

The condition of soft tissues in the mouth (cheek and floor of the mouth), those with fissured tongues (n=30(10.9) and Oral sub-mucous fibrosis or OSMF 5(1.8) are presented in table 3.

More than 83 % of the elderly had ≥ 1 missing teeth. Nearly 39% of the participants had 12 or more pairs of functional teeth. Females had fewer prosthetic devices as only a smaller portion of

participants were wearing dentures or dental prostheses as reflected in table 4.

More than 68% of the participants needed extraction, filling and oral prophylaxis. Oral Hygiene in males was poorer than in females while female showed more dental health care services needs (Table 5).

Table 4: Pairs of functional teeth and dental prosthesis requirements.

Variable	(N=276)		
	n (%)	M (%)	F (%)
Pairs of functional teeth in chewing position (natural or Artificial)			
12 or more pairs of teeth in the chewing position	107 (38.8)	54 (50.5)	53 (49.5)
8-11 pairs of teeth in chewing position	39 (14.1)	16 (41.0)	23 (59.0)
0-7 pairs of teeth in chewing position	130 (47.1)	53 (40.8)	77 (59.2)
Wearing Dental prostheses			
Not required artificial teeth or dental prosthesis	28 (10.1)	15 (53.6)	13 (46.4)
Required artificial teeth or dental prosthesis	203 (73.6)	84 (41.4)	119 (58.6)
Wearing Removal Partial denture only	8 (2.9)	5 (62.5)	3 (37.5)
Wearing Upper Complete denture only	5 (1.8)	4 (80.0)	1 (20.0)
Wearing Lower Complete denture only	1 (0.4)	1 (100.0)	0 (0.0)
Wearing upper complete and lower partial dentures	8 (2.9)	4 (50.0)	4 (50.0)
Wearing lower complete and upper partial dentures	4 (1.4)	1 (25.0)	3 (75.0)
Wearing Complete dentures upper and lower	13 (4.7)	5 (38.5)	8 (61.5)
Crown and bridge	6 (2.2)	4 (66.7)	2 (33.3)

Table 5: Oral hygiene and treatment requirements among the elderly (n = 276).

Variable	(N=276)		
	n (%)	M (%)	F (%)
Oral cleanliness			
Clean, no food particles/tartar on artificial or natural teeth	232 (84.1)	100 (43.1)	132 (56.9)
Food particles/tartar present in one or two sites in the mouth or on artificial teeth/dentures	17 (6.2)	10 (58.8)	7 (41.2)
Food particles/tartar in multiple sites/artificial teeth	27 (9.8)	13 (48.1)	14 (51.9)
Treatment required:			
Extraction, Filling, prophylaxis or scaling	190 (68.9)	80 (42.0)	110 (58.0)
No treatment required	86 (31.1)	43 (50.0)	43 (50.0)

Discussion

The screening data of elderly people highlighted poor oral health status, including significant tooth loss, low use of dental prostheses, and inadequate awareness about oral hygiene practices. These findings were more obvious among female participants [13].

Over half of the participants had dental decays, with 40.3% having four or more decayed teeth. Women were disproportionately affected, reflecting possible differences in oral hygiene practices and healthcare access [14]. Periodontal problems were prevalent, with 17.4% of participants experiencing periodontitis. These find-

ings align with global estimates, which identify periodontitis as a leading cause of tooth loss in older adults [15]. All dental conditions deteriorate with age if preventive measures are ignored [16]. A distressing 83% of participants had 1 or more missing teeth, yet only less than 5% wore complete dentures. Females demonstrated greater unmet needs for dental prosthetics, which may result from financial, cultural, or systemic barriers to care. Addressing these barriers could significantly enhance the quality of life for the elderly. This contradicts that denture care in Bhutan is mostly free and only small user fees are charged for dental prostheses like dentures or crowns [17-19].

While most participants exhibited healthy oral mucosa (96.7% with normal lip conditions), 10.9% had fissured tongues, and 1.8% had oral submucous fibrosis (OSMF). The presence of OSMF, although small, underlines the need for screening, particularly in populations with cultural or dietary predispositions as the OSMF has the propensity to become malignant [20,21]. The low level of good oral health awareness among the elderly further exacerbates these problems. This gap emphasizes the need for targeted health education programs that addresses not only the importance of oral hygiene but also the implications of poor oral health on systemic conditions mainly with noncommunicable diseases (NCD) such as diabetes and cardiovascular diseases [22]. Tailored interventions for women, focusing on affordability and accessibility, could significantly improve oral health outcomes in this category of elderly people [23-25].

To address these findings, an all-inclusive approach is necessary. Policymakers and healthcare providers must collaborate to develop community-based programs aimed at increasing awareness, completely free or further subsidized prosthetic services, and safeguarding gender-sensitive oral health services. Future research should examine the long-term benefits of such interventions, particularly for female populations. A national data for the elderly is warranted for the realization of a conclusion that truly represents the nature of oral conditions and the use of dental services.

Recommendations

Healthcare policymakers should advocate the inclusion and implementation of programme that facilitate the promotion of oral health in the elderly. They should be provided with free healthcare or at a low cost. Studies should be conducted in other settings (Urban, semi-urban, and rural areas) to evaluate the oral health status, treatment needs, and quality of life of the elderly in Bhutan

from time to time. Moreover, every district health centres should conduct dental screening and oral health education targeted to the elderly at least once a year.

Conclusion

The elderly in the capital city Thimphu presented with a higher prevalence of dental caries and less functional teeth with fewer subjects using prosthetic appliances. A very significant finding among many, is low oral health awareness, a possible factor for the findings in this study.

Limitations of the study

The study had several shortcomings. The sample size was small that mainly focused on elderly individuals who came forward for disease screening purposes. Therefore, it may not represent the wider elderly population either in Thimphu or from different parts of the country with different socioeconomic backgrounds and health services-seeking behaviors. As it was a cross-sectional study, it captured limited data only at a single point of time thus limiting the causes and outcome of oral conditions with any certainty. It is acknowledged that oral health deteriorates with increasing age, leading to lop-sided findings. In the field, advanced diagnostic tools like radiographs, which could have provided more precise data on periodontal and dental conditions were not employed. By correcting these limitations, a more inclusive understanding of oral health among the elderly could be achieved in future research.

Conflict of Interests

The authors declare that there is no conflict of interest and didn't receive any financial support regarding the screening, writing or publication of this report.

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