



ASSESSMENT OF GERIATRIC ORAL HEALTH STATUS AND TREATMENT NEEDS IN KHARTOUM STATE, SUDAN (2020–2024)

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ABSTRACT **Background:** Populations are rapidly aging worldwide, and oral health is a key component of general health and quality of life in older adults. In Sudan, there is a substantial information gap regarding geriatric oral health and its impact on daily functioning and well-being. **Objectives:** To evaluate the oral health status and treatment needs of elderly people in Khartoum State using clinical examination and the Geriatric Oral Health Assessment Index (GOHAI), and to explore associations with sociodemographic and general health characteristics. **Methods:** A descriptive cross-sectional institutional- and community-based study was conducted among 400 elderly persons aged ≥ 65 years residing in two elderly care institutions in Khartoum and in Umbada town. Participants were selected by random sampling. Data were collected using a structured questionnaire (sociodemographics, habits, general health) and oral examination according to WHO criteria, including caries, missing and filled teeth, periodontal status, tooth wear, and other oral lesions. GOHAI was applied to assess oral health-related quality of life, and mean responses were analyzed by age, gender, and education using chi-square tests at a 5% significance level. **Results:** The mean age was 69 ± 1.5 years; 61.5% were male and 38.5% female. Most participants had low educational levels, and 59.4% reported an annual income of 200–400 US dollars. Overall, 81% were physically self-dependent and 78% lived with their families. Chronic diseases were common, particularly diabetes mellitus (34.5%) and hypertension (21.5%). Tobacco use was reported by 16.5%, cigarette smoking by 15%, and alcohol consumption by 4.5%. Regarding oral habits, 92% brushed their teeth daily, mainly twice per day. Clinically, 73% had dental caries, 99% had missing teeth, 73.5% had restored teeth, and all participants exhibited tooth wear, predominantly mild. Periodontal disease was highly prevalent, with only 17.5% having healthy gingiva; 41.5% had calculus, 20% gingival bleeding, and 21% periodontal pockets. Treatment needs were considerable: 27% required filling plus bridge, 26% a denture, and 22% filling plus denture. GOHAI responses indicated poor oral health-related quality of life; 43.5% always limited the kinds or amount of food, 38.5% often had trouble biting firm meat or apples, and 49% were only sometimes able to eat without discomfort. Physical, pain and psychological disabilities were frequent; 33% were often physically limited, 31% often experienced oral pain, and 37% sometimes had psychological discomfort related to their oral condition. Increasing age ($p = 0.031$) and being female ($p = 0.000$) were significantly associated with worse GOHAI scores, whereas education showed no statistically significant association ($p = 0.052$). **Conclusions:** Elderly people in Khartoum State have a high burden of dental caries, tooth loss, periodontal disease, tooth wear, and unmet treatment needs, accompanied by poor GOHAI scores despite most being physically independent and having dental insurance. The findings highlight a critical need to integrate geriatric oral health into national health policies, strengthen preventive care and health education, and improve accessibility and utilization of dental services for older adults in Sudan.

KEYWORDS : Geriatric Oral Health, GOHAI, Sudan, Elderly, Periodontal Disease, Quality of Life**INTRODUCTION**

Population aging is accelerating globally, with the proportion of individuals aged 60 years and older increasing in both developed and developing countries[1][2]. The World Health Organization describes the aging population as those individuals aged 60 years or above, and this demographic shift presents substantial challenges to healthcare systems worldwide[3]. Oral health is an essential component of general health and a key determinant of quality of life in older persons, influencing nutrition, communication, social interaction, and psychological well-being[4][5].

Evidence shows that poor oral health in the elderly is associated with chronic diseases, impaired mastication, and increased risk of systemic complications[6][7]. In Sudan, little emphasis has been placed on oral health in old age, and there is a paucity of published data on geriatric oral health status and treatment needs[13]. Khartoum has approximately 5.27 million population, with about 20% being elderly[14].

The Geriatric Oral Health Assessment Index (GOHAI) is a validated instrument to measure oral health-related quality of life in older populations[15]. This study provides the first comprehensive assessment of geriatric oral health status in Khartoum State using clinical examination and GOHAI to inform health policy and service planning.

MATERIALS AND METHODS**Study Design and Setting**

A descriptive cross-sectional study was conducted between 2020 and 2024 in two elderly care homes in Khartoum and Umbada town, Sudan. The sample included 400 elderly persons aged ≥ 65 years, selected by random sampling using Yamane's formula at 95% confidence level.

Data Collection

Data were collected using structured questionnaires (sociodemographic, general health, oral habits), clinical oral examination following WHO criteria (DMFT, periodontal status, tooth wear, oral lesions), and the 12-item GOHAI to assess oral health-related quality of life. Ethical approval was obtained from Khartoum State Ministry of Health and University of Gezira. Data were analyzed using SPSS with chi-square tests to assess associations ($p < 0.05$).

RESULTS**Sociodemographic and General Health Characteristics**

The mean age was 69 ± 1.5 years; 61.5% were male. Educational attainment was low (37% primary, 25% intermediate, 15% university). Most (81%) were physically self-dependent and 78% lived with families. Dental insurance was reported by 81%, yet 38.5% did not attend dental clinics regularly. Chronic diseases were highly prevalent (Table 1).

Table 1: Distribution of Chronic Diseases Among the Study Population (n = 400)

Chronic disease	Percent
No chronic disease	34.5%
Diabetes mellitus (DM)	34.5%
Hypertension (HTN)	21.5%
DM + HTN	6.0%
Cardiac disorders	1.5%
Respiratory disorders	1.0%
Cardiac + DM	0.5%
Cardiac + HTN + DM	0.5%
Total	100%

Diabetes mellitus (34.5%) and hypertension (21.5%) were most

common. Tobacco use (16.5%), cigarette smoking (15%), and alcohol consumption (4.5%) were relatively low. Overall, 92% brushed their teeth daily.

Clinical Oral Health Status

Dental caries affected 73% of participants and missing teeth 99%. Restorations were present in 73.5%. All participants (100%) exhibited tooth wear (68.5% mild, 28.5% moderate). Treatment needs were extensive and complex (Table 2).

Table 2: Oral Health Treatment Needs (n = 400)

Treatment need	Percent
Filling + bridge	27.0%
Denture	26.0%
Filling + denture	22.0%
Bridge	18.0%
Extraction + denture	5.0%
Extraction + filling	1.5%
Filling only	0.5%
Total	100%

Only 0.5% required filling alone; the majority needed complex interventions including fillings, bridges, and dentures. Periodontal disease was highly prevalent (Table 3).

Table 3: Periodontal Health Status (n = 400)

Periodontal condition	Percent
Healthy gingiva	17.5%
Calculus	41.5%
Gingival bleeding	20.0%
Periodontal pocket	21.0%
Total	100%

Only 17.5% had healthy gingiva; 82.5% showed periodontal problems. Other oral lesions included ulceration (27.5%), candidiasis (16.5%), and suspected malignancy (1.5%).

Oral Health-Related Quality of Life (GOHAI Assessment)

GOHAI responses revealed substantial impacts: 43.5% always limited food intake, 38.5% often had trouble biting firm foods, and 49% were only sometimes able to eat without discomfort. Physical disability was reported by 33% often, psychological effects by 37% sometimes, and pain by 31% often.

Associations Between GOHAI and Sociodemographic Factors

Increasing age ($p = 0.031$) and female gender ($p = 0.000$) were significantly associated with worse GOHAI scores. Education showed no significant association ($p = 0.052$).

DISCUSSION

This study demonstrates that elderly people in Khartoum State experience considerable oral disease burden despite high rates of physical independence and dental insurance coverage. The high prevalence of diabetes (34.5%) and hypertension (21.5%) may contribute to the periodontal disease observed in 82.5% of participants [16][17][18].

Despite 92% reporting daily tooth brushing, the high burden of caries and periodontal disease suggests inadequate technique and lack of professional care. The gap between insurance coverage (81%) and regular clinic attendance indicates that financial coverage alone does not ensure service utilization. Barriers include low perceived need, cultural beliefs, transportation difficulties, and lack of awareness [19][20][21].

The complex treatment needs reflect accumulated untreated disease. Most participants required combinations of restorative and prosthetic care, indicating inadequate preventive care throughout their lives. GOHAI findings show that oral health problems substantially impaired nutrition, with 43.5% limiting food choices and 38.5% having trouble biting firm foods, potentially leading to malnutrition [22][23].

The significant association between female gender and worse GOHAI scores ($p = 0.000$) may reflect biological factors, hormonal changes, longer life expectancy, and possibly historical inequities in access to education and resources. The lack of association with education ($p = 0.052$) may reflect the generally low educational attainment and homogeneous socioeconomic constraints in this population [25].

Study limitations include the cross-sectional design and sampling from limited settings. However, this is the first comprehensive assessment of geriatric oral health in Sudan, providing valuable baseline data. Findings support integrating geriatric oral health into national health strategies, developing specialized services, training professionals in geriatric care, and establishing outreach programs for homebound elderly.

CONCLUSION

Elderly people in Khartoum State present with widespread dental caries (73%), tooth loss (99%), periodontal disease (82.5%), and extensive unmet treatment needs, accompanied by poor oral health-related quality of life. Advanced age and female gender are significantly associated with worse GOHAI scores. Despite high rates of dental insurance coverage (81%), service utilization remains insufficient, pointing to critical gaps in awareness and service organization.

These findings strongly support integrating geriatric oral health into national health strategies in Sudan, including preventive programs, professional training in geriatric dentistry, accessible services, and health education campaigns. Future research should evaluate intervention effectiveness and explore barriers to service utilization to adequately address oral health challenges in Sudan's aging population.

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