

Caries Severity and Tooth Loss Status of Adults in Mongolia's Western Region

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Dental caries is a major problem of oral health which plays a role in oral and systematic diseases. The World Health Organization has defined that oral health plays an important role in human health (1979) and in 1981, 2003, created recommendations to reduce oral diseases. It has been mentioned that the prevalence and severity of dental caries vary on developing status of the country, socioeconomic conditions, lifestyle, diet and health education level of the population [1]. Mongolia has been studying dental caries since 1974 and has been doing intensively for the past 20 years [2]. According to previous studies carried out in 1993, the prevalence

of dental caries in the 35-44 age group was 76.6%, in the 65-74 age group was 73.3%, and the intensity in the 35-44 age was 8.15, in the 65-74 age group was 8.1 respectively [3]. The International Association for Dental Research, Mongolian Section, organized the first epidemiological national survey of Mongolians' oral health status in 2013. The results demonstrated that caries in the 35-44 age group was 94.4%, the intensity was 5.4. These findings show that severity of dental caries has increased dramatically among Mongolian adults. Consequently, due to poor oral health education, inadequate oral hygiene, preventive programs and other socioeconomic reasons [4].

Tooth loss in the dental arch is the main cause of the systematic disease, which reduces speaking, chewing, and other capacities for social interaction and quality of life. Generally, it occurs because of caries, periodontal disease, traumatic injury, impactions, neoplastic and cystic lesions. It is a major oral health problem among Mongolians, and it was reported in 1967 that the number of lost teeth had increased by age [5]. Previous studies have reported edentulous status among adults was 28.5% in 1996 [6]. The national survey of oral health status of adults in Mongolia (2013) has reported that the tooth loss was 93.5% in the 35-44 age group, and 98% in the 65-74 age groups respectively [4,6].

The overall goal of the survey was to determine Mongolians' oral health status, to describe severity of dental caries, tooth loss conditions and prosthetic needs, and promote the implementation of oral health policies. The present study demonstrated dental caries prevalence, intensity, and tooth loss status among the population of Mongolia's Western region.

Materials and Methods

Design and location

A descriptive cross-sectional study was conducted in 10 sum-area (permanent sub-unit settlements) of the western region of Mongolia, such as Khovd (Zereg, Mankhan), Zhavkhan (Tosontsengel), Bayankhongor (Buutsagaan), Gobi-Altai (Delger), Uvurkhangai (Kharkhorin, Khujirt), Arkhangai (Tsenher), Uvs (Naranbulag), and Bayan-Olgii (Tolbo) provinces.

Data collection

A total of 475 people aged 18 to 74 years old residing in western region were divided into three age groups; 18-34, 35-44, and 45-74. The Scientific Committee of the MNUMS approved the protocols and informed consents were collected individually from subjects.

The dental examination was performed using a dental mirror, dental explorer and subjects seated on a regular chair and was carried out by 4 calibrated dentists. Caries prevalence was evaluated on DMFT mean values according to WHO criteria by age groups 18-34, 35-44, 45-74-year-olds.

Tooth loss was examined according to classification which was used in Mongolia which reported in a previous study, which were as follows: 0-No tooth loss, 1-Low (1-3 missing teeth), 2-Moderate (4-6 missing teeth), 3-High (7-13 teeth missing), 4-Edentulous.

Data was collected and a database was created in Microsoft Office Excel and was analyzed using Statistical Package for the SPSS version 25.0 software program. Descriptive quantitative analysis was applied for the statistical evaluation of the actual number,

percentage, standard deviation, and mean values. Statistical differences less than 0.05 were considered significant.

Results

A total of 475 adults aged 18 to 74 years old participated in the Western region, of which 76% were female and 24% were men. Caries prevalence in the 18-34 age group was 72.5%, 65% in the 35-44 age group, and 58.1% in the 45-74 age group, respectively. The 35-44 age group had the most filled teeth (153) and the 45-74 age group had the most missing teeth (1526). Caries intensity was 5.41 in the 18-34 age group, 6.69 in the 35-44 age group, and 11.19 in the 45-74 age group (Table 1). Table 1 shows that the prevalence and intensity of caries increase depending on an individual's age.

Age groups	Decayed	Filled	Missed	Intensity
18-34	321	94	321	5.41
35-44	368	153	549	6.69
45-74	376	101	1526	11.19
Total	1065	348	2396	8.02

Table 1: DMF/teeth by age group.

The prevalence of tooth loss in Western populations was 84.03%; in the 18-34 age group, it was 75%; in the 35-44 age group, it was 85%; and in the 45-74 age group, it was 92.1%. The prevalence of tooth loss by number, (classified as lowest, moderate, high number of tooth loss) in the upper arch, the low was 85.9%, moderate was 10.9% and the high was 3.1% in the 18-34 age group. In the 35-44, the low number of tooth loss was 81.4%, moderate was 13.4% and the high was 5.2%, whereas in the 45-74 age group, the low was 43.4%, moderate was 31% and the high was 25.5% respectively. In the mandibular dental arch, the low number of tooth loss was 86.7%, the moderate was 12.2% and the high was 1.1% in the 18-34 age group. Thus, in the 35-44 age group, the low was 78.1%, the moderate was 20.2%, and the high was 1.8%. Whereas in the 45-74 age group, the low was 35.9%, the moderate was 42.3%, and the high was 21.8% respectively. Data shows a correlation between the number of lost teeth and age groups. In the 18-34 age group, the percentage of lost teeth was low, whereas in the 35-44 and 45-74 age groups, the percentage of lost teeth was continuously increasing in both upper and lower dental arches.

The summary of all findings is shown in Table 2. Caries prevalence, caries intensity, and tooth loss depend on different age groups. In the 18-34 group, c/prevalence was 72.05%, c/intensity was 5.41, and the prevalence of tooth loss was 75%. In the 35-44 age group, c/prevalence was 65%, c/intensity was 6.69, and tooth loss was 85%, whereas in the age group 45-74, c/prevalence was 58.1%, c/intensity was 11.9, and tooth loss was 92.1%, respectively (Table 2).

Age groups	18-34	35-44	45-74	Average
C/Prevalence	72.05%	65%	58.1%	65.05%
Tooth loss	75%	85%	92.1%	84.03%
C/Intensity	5.41	6.69	11.19	8.02

Table 2: Caries prevalence, intensity, and tooth loss by age groups.

Discussion

From a literature review, 3.58 billion people worldwide have dental caries and 2.4 billion adults are suffering (2016) from chronic dental caries [7]. In Mongolia, previous dental caries studies were performed during the period between 1991 to 2008. Most research studies were performed in urban areas. Unfortunately, a low percentage (6.8%) of studies were performed within the rural population. According to these studies, the prevalence and severity of dental caries among the population of Mongolia have increased dramatically in the last 30 years due to changing lifestyle and food consumption, lack of oral health knowledge, lack of implementation of dental caries prevention programs, and the level of fluoride in local drinking water around most areas [4,7]. On the other hand, the major affecting factors are the socio-economic status of our country, the availability of dental care services, insufficient dental care practices, the consumption of carbohydrate-containing foods, etc. [8]. In the present study, caries prevalence and intensity increased with subject age. According to WHO criteria, severity of caries status indicates a "MID" level. However, caries status implies similar results obtained by surveys performed in Mongolia and in other countries such as China (2013), Turkey (2008), the north-western region of Russia (2017) and Egypt (2019), suggesting the possibility that dental caries caused due to the same reasons as mentioned above [9-12].

The level of tooth loss is an indicator of populations' oral health status. According to all findings, the most comparable age groups are represented by 35-44- and 65-74-year-olds. However, there are only a few at the age of 65-74 in rural areas of Mongolia. Therefore, we created an age group of 45 to 74-year-olds. In Western populations, the prevalence of tooth loss was 75% in the 18-34 age group, 85% in the 35-44 age group, and 92.1% in the 45-74 age group. The average of tooth loss in 18-74-year-olds was 84.03% due to a lack of dental services and a poor population in rural areas. Among adults in the UK, the prevalence of tooth loss was 94.4%; in Brazil, it was 98.3%; among 14- to 74-year-old adults, it was 76.12% (India); and in China, aged 65 and over, it was 80.72%, which is similar to the Mongolian examination's results [9,13-15]. The number of lost teeth among Western people, the low level was 63%, the moderate level was 25%, and the high level was 12% in both dental

arches. In the previous study, the low level of tooth loss was 52.6% (2019), the moderate level was 36.8% (2015), and the high level was 40.57% (1996), which is similar to our result at the low and moderate levels [6,16,17]. However, the high level of tooth loss was higher among urban people than rural people in the present study. Perhaps the present results may have been related to other conditions: reasons for loss of teeth, lifestyle patterns of ethnic groups, lack of oral health education, lack of availability of dental services, etc.

All of the findings indicate a high prevalence of caries and tooth loss, necessitating the development of recommendations for preventive and dental service measures to provide dental care to rural Mongolians.

Conclusion

In conclusion, the caries prevalence, intensity, and tooth loss among adults in Western Mongolia were high and increased with age. The lowest percentage of caries prevalence and tooth loss was in 18-34-year-olds, continuously increasing by age group, whereas the highest percentage was in 45-74-year-olds. This correlation of dental caries and tooth loss status with age groups supports the development of prevention programs and appropriate dental treat-

Bibliography

1. World Health Organization. Oral health surveys: basic methods, 5th edition (2013).
2. Diagnosis of common oral disease. Ulaanbaatar (2006).
3. Tsolmon Kh. "Common oral diseases" (1993).
4. International Association for Dental Research: Mongolian section. "The national survey of oral health status of children and adults in Mongolia". *IADR Regional Development Programme* (2013).
5. Selee D. "Oral diseases of populations' and dental treatment needs in Mongolia". *Doctoral Degree Dissertation* (1974): 16.
6. Bataa D. "Clinical classification of partial edentulism". *MD Degree Dissertation* (1996): 35.
7. Bolormaa I, et al. "Fluoride content of drinking water and its effect in oral diseases". *Mongolian Medicine* 3 (112): 10-14.
8. Ramanarayanan V, et al. "Prevalence of Tooth Mortality among Adults in India: A Systematic Review and Meta-Analysis". *Contemporary Clinical Dentistry* 12 (2021): 339-345.

9. Liu L., *et al.* "Prevalence and correlates of dental caries in an elderly population in northeast China". *PLoS One* 19 (2013): e78723.
10. Vehid S., *et al.* "Dental health status and risk factors for dental caries in adults in Istanbul, Turkey". *East Mediterr Health Journal* 14 (2008): 110-118.
11. Drachev SN., *et al.* "Dental caries experience and determinants in young adults of the Northern State Medical University, Arkhangelsk, North-West Russia: a cross-sectional study". *BMC Oral Health* 17 (2017): 136.
12. El Moshly S., *et al.* "The prevalence of dental caries among Egyptian children and adolescences and its association with age, socioeconomic status, dietary habits and other risk factors. A cross-sectional study". *National Library of Medicine* 8 (2019): 10.12688.
13. Heidari E., *et al.* "Oral health status of non-phobic and dentally phobic individuals; a secondary analysis of the 2009 Adult Dental Health Survey". *British Dental Journal* 219 (2015): E9.
14. Colaço J., *et al.* "Tooth loss and associated factors in the elderly in Cruz Alta, Brazil: a cross sectional study". *Acta odontológica Latinoamericana* 32 (2019): 172-180.
15. D'Souza KM., *et al.* "Association between socio-demographic variables and partial edentulism in the Goan population: An epidemiological study in India". *Indian Journal of Dental Research* 25 (2014): 434-438.
16. Javkhlan P., *et al.* "Edentulism and Prosthetic needs among people visited in University Dental Hospital of MNUMS". *Dentistry* (2018): 9-18.
17. Bayasgalan B. "Partial edentulous condition among people aged 35-44 in Bayangol district of Ulaanbaatar city, Mongolia". *MD Degree Dissertation* (2015): 41.