

Assessment of Dental Caries and Periodontal Disease Status among Elderly Residing in Old Age Homes of Madhya Pradesh

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Abstract:

Background: A descriptive cross-sectional study was carried out to assess the dental caries and periodontal disease status of elderly residing in old age homes of Madhya Pradesh, India.

Materials and Methods: The study was carried out on 599 elderly people residing in old age homes of Madhya Pradesh, India using cluster sampling methodology. The clinical findings were recorded using modified WHO Oral Health Assessment form (1997) to assess periodontal status as per community periodontal index, loss of attachment, WHO dentition status, and treatment needs.

Results: In the present study, the caries prevalence among dentate subjects was found among 41.9% of the dentate subjects and the mean decayed, missed, and filled teeth was found to be 8.28 ± 4.779 with the mean number of decayed being 1.51. In the dentate population, 0% had healthy periodontal tissue, 0.26% had bleeding, and 24.5% had calculus, 52.1% had shallow pockets and 23.1% had deep pockets as their highest score and this difference was statistically significant ($P < 0.05$). In the current study, 37.9% inmates were completely edentulous. This study also showed that as age advanced the prevalence increased from 23.1% to 55.4%. The difference was statistically significant ($P < 0.05$).

Conclusion: The oral health status of elderly people was found to be poor. Hence, it is concluded from this study that tooth loss is higher among the geriatric group residing in old age homes and is associated with many demographic and behavioral risk indicators.

Key Words: Dental caries, elderly, old age homes, periodontal disease

Introduction

Throughout the world, a demographic revolution steps forward. The proportion of older people is growing faster than of any other age group. Approximately, 600 million people are aged 60 years and over, and this number will double by 2025. By 2050, it will be 2 billion, 80% living in developing countries.¹ The Indian aged population is currently the second largest in the world (about 75 million). Projection studies indicate that the number of 60+ in India will increase to 198 million in 2030.² The present day population in almost all developed and developing countries have become aware about the importance of maintaining good health. This poses tremendous challenges to health and social policy planners, particularly because disease patterns will shift concurrently.^{1,2}

Elderly or old age consists of ages nearing or surpassing the average life span of human beings. Government of India adopted "National Policy on Older Persons" in January, 1999. The policy defines "senior citizen" or "elderly" as a person who is of age 60 years or above.³

Old age homes or residential homes are geriatric long care facilities which provide supervision and assistance in activities of daily living with medical and nursing services when required.⁴

Discoveries in medical science and improving social conditions, mortality rate has also decreased the average life span in most parts of the world continues to increase. This is called "graying of the society or global graying."⁵ The demographic imperative is expected to have a major impact on the dental professionals and oral health care delivery. The 20th century has witnessed remarkable change with regard to health and disease and longevity and mortality in India.^{6,7}

Of many issues concerning the welfare of elderly, health is one of the major concerns. In the elderly people, oral health contributes significantly toward the quality of life. Poor oral health including dental caries, periodontal disease, and loss of teeth can adversely affect the dietary intake and nutritional status and thereby compromise health. Similarly, systemic diseases and/or the adverse side effects of their treatments can lead to an increased risk of oral diseases.⁸

Barriers to oral health care among the elderly are considerable. Impaired mobility impedes access to oral health care. The situation is worsened in developing countries when oral health services and domiciliary care are not available. Given that some older people may experience financial hardship following retirement, the cost or perceived cost of dental treatment, together with poor attitudes to oral health, may deter them from visiting a dentist.⁹

Financially deprived, mentally and physically disabled elderly are abandoned by the society and left alone. With none to live with and care for them, elders have to look for an alternative home for security, companionship, care, and a life of dignity. Old age or residential homes for geriatrics work here as an alternative.¹⁰

Elderly people living in old age homes have even poorer dental health than those residing at home. Residents rarely receive more than emergency treatment for dental pain and discomfort. Although there is no dentist working regularly in the residential homes, they can be referred to hospitals for dental care and need of denture, and transportation can be arranged.¹¹

The old age home environment has several unique features. It serves the population, which is at greater risk of illness and functional loss, and it is intended to provide a more buffered, less demanding environment. This combination may accentuate the impact of oral status on well-being. It is our social responsibility to provide this segment of society with high quality health care.¹¹

Globally, there are several studies on the dental status of geriatric people, indicating poor oral health.¹²⁻¹⁵ Data on the oral health of this elderly, institutionalized population in India is scant. Very few studies have been conducted about the oral health status of the ageing population living in old age homes. In Madhya Pradesh, the baseline data regarding oral health status and treatment needs for this population is not being documented. Keeping in mind the need for it, a scientific study is designed to assess the dental caries and periodontal disease status of this population in order to integrate demographic, epidemiological, and biological data to help dental professionals to devise a prevention-based intervention program which includes regular oral health screenings and oral health education programs.

Materials and Methods

A descriptive cross-sectional study was designed to evaluate oral health status and treatment needs of elderly residing in old age homes of Madhya Pradesh, India. The study is a total enumeration of the entire subjects of these old age homes. The study population who were present on the day of examination was considered and the age ranged from 60 to 89 years.

Madhya Pradesh often called the heart of India, is a state in central India. Its capital is Bhopal. Madhya Pradesh is the 2nd largest state by area and 7th largest state by population.¹⁶ According to census 2001 the population of elderly in Madhya Pradesh was about 4,400,000.¹⁷

In Madhya Pradesh, there is a high demand for long care facilities for older people. To assist them, many older people who do not have family or financial support are housed in government funded shelter homes in Madhya Pradesh. According to the social justice department of Madhya Pradesh government, there are 47 such shelter homes, which provide social and rehabilitative support to the elderly. These homes are established under Madhya Pradesh Nirashriton Avam Nirdhan Vyaktiyon Ki Sahayata Adhiniyam, 1970.¹⁸ According to that adhiniyam poor and destitute elderly shall be housed in old age home.

A list of old age homes in Madhya Pradesh was obtained from Ministry of Social Justice and Empowerment. According to the Department of Social Justice and Empowerment of Madhya Pradesh, there are 47 old age homes are working in the state. Cluster sampling methodology was used for selection of the study subjects. Each old age home formed a cluster. 17 old age homes were randomly selected from various parts of the state.

A survey was systematically scheduled to cover all the old age homes according to the convenience of the institutional authorities. The survey period extended from the month of February 2011 to June 2011. A detailed monthly schedule was prepared well in advance by informing and obtaining consent from authorities of respective institutes. Although a detailed schedule plan was prepared meticulously, few adjustment and changes were called for while working it out practically.

A preliminary test was conducted among 40 elderly people residing in old age home of Bhopal with the following objectives:

1. To assess the feasibility of the study
2. To assess the validity and accuracy of the predesigned proforma and the reliability of the examiner and to know the practical test and communication difficulties while examining oral cavity of this group of subjects. The intra reliability of the examiner was assessed by using the weighted kappa statistics, which was 92% for decayed, missed, and filled teeth (DMFT), while for community periodontal index (CPI) it was 84%, respectively.

All the inmates present and had given consent to participate in the study on the days of examination in of selected old age home were included in the study. Inmates who did not give the consent to participate in the study and severely systematically ill inmates who were unable to take part.

In a pilot study, prevalence of periodontal disease and dental caries was found 65% and 35% in inmates of old age home. Results of the pilot study were utilized for calculation of sample size and to know the feasibility of the study. Sample size was calculated by using sample size estimation formula. Hence, a sample size of 546 was estimated. A more than the calculated sample size was taken in the study (599).

Ethical clearance for the study was obtained from the Ethics Committee, People's College of Dental Sciences and Research Centre, Bhopal. Institutional consent was taken from the authority of respective old age home. Written consent was also taken from the inmates who were literate and for illiterate inmates verbal consent was taken.

To ensure uniform interpretation, understanding and application by the examiner, of the codes and criteria for the various diseases and conditions to be observed and recorded in the proforma used, the examiner was priorly calibrated and trained in the Department of Preventive and Community Dentistry. The recorder in the study was also priorly trained in the department. The intra reliability of the examiner was assessed by using the weighted kappa statistics, which was 92% for DMFT while for CPI it was 84%, respectively.

A pre-tested proforma was used to record information about demographic data, educational status of inmates, oral hygiene practices, dietary habits, previous visit to dentist. This part of proforma was filled by the examiner himself by interviewing elderly inmates before examination.

The same examiner conducted the clinical examination using modified WHO Oral Health Assessment form (1997)¹⁹ to assess periodontal status as per CPI, loss of attachment (LOA), WHO dentition status, and treatment needs. The recorder recorded the clinical examination finding as dictated by the examiner.

Examination was done in premises of respective old age home with the aid of a mouth mirror and CPI probe under adequate natural light (Type III examination) and also artificial light as and when needed.

Any oral disease or pathological conditions observed during examination were informed to the subjects, and they were advised to seek treatment for the same. Individuals requiring emergency treatment were immediately referred to nearby dental hospital.

The data were subjected to statistical analysis using Statistical Package for Social Sciences software version 18.0. Distribution of subjects according to various criteria and age groups was done and then subjected to tests of significance. For comparing categorical data, chi-square test was used. For a comparison of means between two groups, *t*-test, and more than two groups, Analysis of Variance was used.

Results

A total of 599 elderly comprised the sample. Elderly were classified age wise in three groups, majority of elderly 279 (46.6%) were from the age group of 65 to 74 years. Of the total, 315 (52.6%) elderly were males and 284 (47.4) were females (Table 1).

Out of 599 inmates, 227 (37.9%) were edentulous and 372 (62.1%) were dentate. Majority of edentulous elderly 103 (55.4%) were from the age group of ≥ 75 years. The difference was statistically significant ($P \leq 0.05$).

Majority of elderly 522 (87.1%) were freely mobile without support and 77 (12.9%) had difficulty in moving without support. Among dentate and edentulous subjects, 34 (90.9%) and 43 (18.9%) reported difficulty in mobility without support, respectively.

Majority of the subjects 379 (63.3%) were illiterate. Illiteracy was more 175 (46%) in 65-74 years age group. Among all illiterates, females were more illiterate 196 (51.8) than males 183 (48.3%).

A total of 332 (89.2%) dentate subjects brushed their teeth once a day and 40 (10.8%) reported of brushing two or more times a day. This difference was statistically significant ($P < 0.05$).

In the elderly population, 66 (17.7%) subjects used toothbrush, 177 (47.6%) used finger and 123 (33.1%) used datun to clean their teeth. This difference was not statistically significant ($P > 0.05$).

Toothpowder was used by 165 (44.4%) elderly for cleaning their teeth, whereas only 70 (18.8%) study subjects used toothpaste to clean their teeth. There were 47 (12.6%) subjects who reported the use of ash and brick powder to clean their teeth and 90 (24.2%) not used any cleaning material. This difference was not statistically significant ($P > 0.05$).

All old age homes were providing vegetarian food. Majority of elderly 573 (95.75%) were having the habit of snaking between meals.

Among the study population, a total of 109 (18.20%) only visited dentist previously, maximum 53 (8.84%) of them belong to 65-74 years of age group. The association of visit to

| Age groups (year) | n (%) | | |
|-------------------|------------|------------|------------|
| | Male | Female | Total |
| 60-64 | 69 (51.5) | 65 (48.5) | 134 (22.4) |
| 65-74 | 153 (54.8) | 126 (45.1) | 279 (46.6) |
| ≥ 75 | 93 (50) | 93 (50) | 186 (31) |
| Total | 315 (52.6) | 284 (47.4) | 599 (100) |

dentist with the age group was not statistical significant. This study revealed the need of prosthesis (10.4%) as the most common reason for dental visit; the second most common reason being extraction (5%). There was no significant difference found ($P > 0.05$).

The mean DMFT recorded in the study population was 8.28. The DMFT was highest in the age group ≥ 75 , i.e., 13.10 and it was lowest in the age group 60-64 i.e., 4.72, which was statistical significant ($P < 0.05$). The mean decayed component was 1.51 in the total population and it was highest in ≥ 75 (1.65) and lowest in 60-64 (1.23). The mean missing component was 6.70 in the total population and it was highest in ≥ 75 (11.36) and lowest in 60-64 (3.46), which was statistical significant ($P < 0.05$). The mean filled teeth in the total population were 0.05 and highest in 65-74 (0.06) and lowest in both other age groups (0.04). The mean DMFT recorded in males was 8.39 while in the female was 8.17, which was not statistically significant ($P > 0.05$) (Table 2).

Mean number of sextants with bleeding was 0.32 ± 0.732 , which was statistically significant ($P \leq 0.05$). Mean number of sextants with calculus deposits was 2.11 ± 1.991 , which was statistically significant ($P \leq 0.05$). Mean number of sextants for shallow pockets and deep pocket were 2.06 ± 1.76 and 0.48 ± 0.915 , respectively. This difference was also statistically significant. Mean number of excluded sextants increased with increasing age, for 60-64 years age group it was 0.37 ± 0.727 and it is maximum (2.05 ± 1.070) for ≥ 75 years age group. This difference was statistically significant ($P < 0.05$) (Table 3).

In males, mean number of sextants for shallow pockets showed maximum value (2.13 ± 1.827) and in females, mean number of sextants for calculus showed maximum value (2.15 ± 1.992). This difference was statistically not significant.

Mean number of sextants with no LOA score = 0 was 1.66 ± 2.311 , which was statistically significant ($P < 0.05$) and mean number of sextants with LOA score = 1 was 1.28 ± 1.635 . Mean number of sextants with LOA score = 2 was

1.06 ± 1.437 . Mean number of sextants with LOA score = 3 was 0.06 ± 0.290 . Mean number of sextants with LOA score = X (excluded sextants) was 1.04 ± 1.085 , which was statistically significant ($P < 0.05$) (Table 4).

In the present study, none of the subjects was found to have a completely healthy periodontium 0 (0%). In the present, most frequently observed periodontal conditions was shallow pocket (pocket 4-5 mm) seen in 52.1% of the dentate subjects. With age highest CPI score increased. The difference was statistically significant ($P < 0.05$) (Table 5).

In the present, most frequently observed periodontal conditions with respect to LOA was 4-5 mm seen in 30.1% of the dentate subjects. There was a statistically significant difference noted between age and highest LOA score ($P < 0.05$) (Table 6).

Discussion

Among the elderly inmates almost 99% practiced oral hygiene and 3.3% needed help of caretaker to do oral hygiene. Among the dentate inmates oral self-care of the elderly group was excessively poor with a low percentage (17.7) of inmates practicing tooth brushing, about half (47.6%) of the inmates used finger and 33% used datum (tree stick) for cleaning teeth. According to Unlüer *et al.* (2007)²⁰ and Nagesh *et al.* (2005)²¹ only 15% and 32.69% population practiced tooth brushing this is in agreement with the existing study. Inconsistent results were reported in National Oral Health Survey (2004) MP.²² and Gaiao *et al.* (2009)²³ in which 43.85% and 51.3% of elderly were practicing tooth brushing, respectively. About 45% inmates used red tooth powder which was provided them by old age home authority. Contemporary study indicates the limited use of tooth brush and tooth paste by the inmates. This may be due to lack of knowledge and awareness of inmates regarding the use of good oral hygiene measures or sufficient amount of toothbrushes or toothpastes are not provided by old age home authority. Financial constraints and fewer aids from government could be the additive cause for not providing it.

All the old age homes were providing vegetarian food to the inmates; tea was served 2 times a day and sweets occasionally. About 95.6% of inmates had more or less comparable dietary habits. Hence, dietary habits may not play a major role for causing any of the diet related oral disease among this study group.

Caries prevalence among dentate subjects was 41.9% with mean DMFT 8.28 ± 4.779 and mean number of decayed being 1.51. Similar results were obtained by the studies of Kalsbeek *et al.* (1991)²⁴ and Cortes Martinicorena *et al.* (1993)²⁵ and Angelillo *et al.* (1990).²⁶ Results of Heft and Gilbert (1991),²⁷ Rao *et al.* (1999)²⁸ and Mary *et al.* (2010)²⁹ is inconsistent with the contemporaneous study, this may be due to the reason that in the elderly, physiologic occlusal attrition removes all the retentive grooves and pits. Another

Table 2: Mean DT, MT, FT, and DMFT according to age group and gender.

| Variables | DT | MT | FT | DMFT |
|-------------------|------------|-------------|----------|-------------|
| Age groups (year) | | | | |
| 60-64 | 1.23±1.880 | 3.46±3.238 | 0.04±239 | 4.72±3.499 |
| 65-74 | 1.60±2.240 | 6.42±4.456 | 0.06±287 | 8.11±3.557 |
| ≥75 | 1.65±2.276 | 11.36±5.562 | 0.04±188 | 13.10±4.482 |
| Total | 1.51±2.156 | 6.70±5.239 | 0.05±254 | 8.28±4.779 |
| F value | 1.197 | 73.543 | 0.520 | 114.050 |
| P value | >0.05 | <0.05 | >0.05 | <0.05 |
| Gender | | | | |
| Male | 1.55±2.198 | 6.78±5.375 | 0.06±273 | 8.39±4.872 |
| Female | 1.47±2.116 | 6.62±5.100 | 0.04±233 | 8.17±4.687 |
| t value | 0.332 | 0.295 | 0.445 | 0.428 |
| P value | >0.05 | >0.05 | >0.05 | >0.05 |

DMFT: Decayed, missed, and filled teeth

Table 3: Distribution of mean number of sextant affected by periodontal diseases according to age groups.

| Variables | Mean±SD | | | | | |
|-------------------------|---------|------------|------------|----------------|-------------|-------------------|
| | Healthy | Bleeding | Calculus | Shallow pocket | Deep pocket | Excluded sextants |
| Age groups (year) n (%) | | | | | | |
| 60-64 | 0.0±0.0 | 0.53±0.850 | 2.90±2.003 | 1.98±2.029 | 0.22±0.685 | 0.37±0.727 |
| 65-74 | 0.0±0.0 | 0.29±0.751 | 2.04±1.921 | 2.31±1.809 | 0.40±0.891 | 0.96±0.920 |
| ≥75 | 0.0±0.0 | 0.11±0.383 | 1.29±1.771 | 1.60±1.104 | 0.95±1.047 | 2.05±1.070 |
| Total | 0.0±0.0 | 0.32±0.732 | 2.11±1.991 | 2.06±1.764 | 0.48±0.915 | 1.04±1.085 |
| F value | | 8.344 | 16.641 | 4.808 | 17.094 | 79.896 |
| P value | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

SD: Standard deviation

Table 4: Mean number of sextants with LOA, by score.

| Variables | Mean±SD | | | | | |
|----------------|------------|------------|------------|------------|------------|------------|
| | LOA 0 | LOA 1 | LOA 2 | LOA 3 | LOA 4 | LOA-X |
| Age (in years) | | | | | | |
| 60-64 | 2.91±2.401 | 1.31±1.462 | 0.69±1.112 | 0.46±0.958 | 0.17±0.568 | 0.37±0.727 |
| 65-74 | 1.49±2.283 | 1.33±1.751 | 1.17±1.545 | 0.77±1.259 | 0.22±0.671 | 0.96±0.920 |
| ≥75 | 0.47±1.328 | 1.13±1.576 | 1.29±1.469 | 0.65±0.956 | 0.25±0.678 | 2.05±1.070 |
| Total | 1.66±2.311 | 1.28±1.635 | 1.06±1.437 | 0.66±1.123 | 0.21±0.645 | 1.04±1.085 |
| F value | 30.898 | 0.453 | 5.108 | 2.590 | 0.341 | 79.896 |
| P value | <0.05 | >0.05 | <0.05 | >0.05 | >0.05 | <0.05 |

LOA: Loss of attachment, SD: Standard deviation

Table 5: Distribution of subjects according to highest CPI score - age group wise.

| Variables | n (%) | | | | | |
|----------------------|---------|----------|-----------|---------------|---------------------|------------|
| | Healthy | Bleeding | Calculus | Pocket 4-5 mm | Pocket 6 mm or more | Total |
| Age group (in years) | | | | | | |
| 60-64 | 0 (0) | 0 (0) | 40 (38.8) | 52 (50.5) | 11 (10.7) | 103 (27.7) |
| 65-74 | 0 (0) | 1 (0.5) | 41 (22) | 109 (58.6) | 35 (18.8) | 186 (50) |
| ≥75 | 0 (0) | 0 (0) | 10 (12) | 33 (39.8) | 40 (48.2) | 83 (22.3) |
| Total | 0 (0) | 1 (0.26) | 91 (24.5) | 194 (52.1) | 86 (23.1) | 372 (100) |

Chi-square=50.309, df=6, P<0.05, CPI: Community periodontal index

Table 6: Distribution of subjects according to highest LOA score - age group wise.

| Variables | n (%) | | | | | |
|----------------------|-----------|------------|-----------|-----------|---------------|------------|
| | 0-3 mm | 4-5 mm | 6-8 mm | 9-11 mm | 12 mm or more | Total |
| Age group (in years) | | | | | | |
| 60-64 | 26 (26.2) | 39 (37.9) | 17 (16.5) | 12 (11.7) | 9 (8.7) | 103 (27.7) |
| 65-74 | 30 (16.1) | 53 (28.5) | 38 (20.4) | 41 (22) | 24 (12.9) | 186 (50) |
| ≥75 | 6 (7.2) | 20 (24.1) | 24 (28.9) | 21 (25.3) | 12 (14.5) | 83 (22.3) |
| Total | 62 (16.7) | 112 (30.1) | 79 (21.2) | 74 (19.9) | 45 (12.1) | 372 (100) |

Chi-square=22.289, df=8, P<0.05, LOA: Loss of attachment

reason may be that in the existing study a majority of the sample had habit of chewing tobacco, so the protective effect of chewing tobacco due to excessive salivation and the cariostatic action of lime may resulted in low mean number of decayed teeth.

The mean number of missing teeth among the dentate subjects in this study was 6.7% similar to the results reported by Cortes Martincorena *et al.* (1993)²⁵ and Cruz *et al.* (2001).³⁰ Contradictory results were reported by Rao *et al.*, (1999)²⁸ Thomas *et al.* (1994).³¹ Tooth loss due to caries is less and most missing teeth were contributed by the periodontal disease compared to other studies. Hence, overall missing component in the present study is comparatively lower. There

is also a significant increase in the mean number of missing teeth as age advanced. These findings are in line with that reported by Rao *et al.* (1999),²⁸ Loh *et al.* (1996).³² Deleterious oral hygiene practices, insufficient supply of tooth brushes and tooth pastes, tobacco-related habits, lack of awareness and non-availability of nearby dental services which finally results in loss of teeth.

Mean number of filled teeth was 0.05 which was in accordance with the findings of National Oral Health Survey and Fluoride Mapping (2004) MP,²² Rao *et al.* (1999)²⁸ and Cortes Martincorena *et al.* (1993).²⁵ These results were not in agreement with the studies of Slade *et al.* (1997)³³ Estie *et al.* (2007)³⁴ and Kalsbeek *et al.* (1991)²⁴ having high number of

filled teeth. This could be due to the reason as these studies were done in developed countries, the facilities and awareness regarding oral health is much higher than our country.

Traditionally with age periodontal disease increases and almost everybody more or less susceptible to it. This belief has come from both epidemiologic studies and clinical observations.³⁵ Increasing edentulousness with age is usually reflects ravages of destructive periodontal disease, and greater mean tooth loss and mean periodontal index scores in older age groups.

In the present study, none of the subjects was found to have a completely healthy periodontium. This finding is similar to that reported by Holmgren *et al.* (1994)³⁶ in their study on the Honk King Chinese. However, Rao *et al.* (1993)³⁷ in their study on the rural elderly in Varanasi, India, reported that 8.5% of the subjects presented with a healthy periodontium.

Most frequently observed periodontal conditions was shallow pocket seen in 52.1% of the dentate subjects. The verdicts are comparable with that observed by Rao *et al.* (1999)²⁸ in Indian population and Miyazaki *et al.* (1995)³⁸ in the Japanese population. However, Hu *et al.* (1990)³⁹ in their study among the elderly Chinese found that the most frequently observed condition was calculus. Historic evidence of progression of periodontal disease with increasing age with an increase in pocket depth and excluded sextants, illiteracy and practicing deleterious oral hygiene like using finger, datun and red tooth powder instead of tooth brush and toothpaste and tobacco related habits promotes poor oral health.

LOA was determined in order to obtain an estimate of the lifetime accumulated destruction of the periodontal attachment. In the present study, most frequently observed periodontal conditions with respect to LOA was 4-5 mm seen in 30.1% of the dentate subjects. Similar results (54.4%) was reported in National Oral Health Survey and Fluoride Mapping (2004) MP,²² but in a study done by Mary *et al.* (2010)²⁹ most frequently observed LOA was 9-11 mm (33%).

The prevalence of edentulousness can be regarded as a rough, but instructive indicator of the oral health of the elderly population. In the present study, 37.9% inmates were completely edentulous. Angelillio *et al.* (1990)²⁶ and Ong *et al.* (1992)⁴⁰ in their study found the prevalence of edentulousness to be 59.8% and 51.2%, respectively. Miyazaki *et al.* (1995)³⁸ in their Japanese study found that 30% of the subjects were completely edentulous and Loh *et al.* (1996)³² in their study on the Chinese residents in Singapore found the prevalence to be 27.3%. However, the study conducted by Thomas *et al.* (1994)³¹ among the elderly of South India showed a very low prevalence of edentulousness (18.3%). This study also showed that as age advanced, the prevalence increased from 23.1% to 55.4%.

Subjects who experienced difficulty in moving around without support had a significantly higher prevalence of edentulousness (39.1%) as compared to those who could move around freely (35.2%). This trend could be explained as being not only due to their higher degree of helplessness at present, but also due to the dental neglect and accumulated oral problems during the past years when they were still living at home with deteriorating general health.

Conclusively, as the period of stay in the old age home increased, there was a trend for an increase in the prevalence of edentulousness. However, it could not be determined whether this trend was due to the past dental experience of the subjects or the environment of the old age home.

In the current study, 18.2% of study subjects visited to a dental surgeon. This study revealed the need of prosthesis (10.4%) a most common reason for dental visit; the second most common reason being extraction (5%). Bansal *et al.* (2010)⁴¹ reported 63.2% of study population visited a dental surgeon and 36.8% had never visited a dental surgeon. This indicates a lack of awareness regarding oral health, non-availability of dental treatment or inaccessibility to nearby dental office in the present study.

Conclusion

It is concluded from this study that tooth loss is higher among the geriatric group residing in old age homes and is associated with many demographic and behavioral risk indicators. Identifying the people at high risk for tooth loss is important in terms of clinical interventions to preserve the natural dentition and ensure that it remains adequately functional and socially acceptable throughout the lifespan of the individual.

Taken together the data of prevalence of oral diseases among the study population indicates more lack of awareness among the study population about oral diseases, oral hygiene practices, preventive measures and adverse effects of tobacco and lack of access to the needed services. The results also indicate a high prevalence of missing teeth, periodontal disease, and prosthetic needs.

The fact accumulated during the survey brings out vividly the need to develop a universally accessible seniors' program to service dental needs, provision of dental facility at the premises of respective old age homes, provide oral health education, especially oral hygiene methods, implement health promotion strategies. Efforts to improve the oral health of the geriatric population would be an exciting and innovative initiative.

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