

Comparison of Oral Health Status and Dental Treatment Needs of Geriatric Patients in Developing and Developed Countries: A Review of the Literature

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ABSTRACT

Aging phenomenon has been the rising concern faced in the 21st century. By the year 2050, it is projected that an increase in the population aged 60 years or over will be half of the total growth of the world population. The purpose of this article is to provide an overview of various oral conditions of old patients, risk factors associated with it and dental care needs in developing and developed countries and compare the results. A total of 12 articles have been systematically reviewed. Electronic databases (Cochrane central register of controlled trials, MedLine, PubMed, and Embase) were screened for studies published from the 1990s to February 2016. The search was concentrated more on original studies related to the topic and was limited to the English language. Gray literature was screened systematically. During the review process, the author and the journals were not blinded by the reviewer and the entire process was accomplished by one reviewer. Data collected from these articles revealed that poor oral health is an inevitable condition among geriatric patients regardless of the countries they belong to. The oral health-care system of industrialized countries is much more organized than that of developing countries, which allow them to provide dental care to elderly in need. In conclusion, evidence-based research is much needed in developing countries to have a better understanding of the barriers which makes dental care inaccessible for this particular population, especially ones who are institutionalized or living in rural areas.

Keywords: Developed countries, Developing countries, Geriatric, Oral health status

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INTRODUCTION

Recent advances in the field of research and medicine have led to a surge in life expectancy and decrease in fertility. The concept of the aging population has gained a lot of importance due to the drastic rise in the aged population in developing and developed countries. It is estimated that 737 million older persons, in 2009, are likely to increase to two billion by 2050; population aged 60 and above will outnumber children aged 14 and below.¹ In 2013, India was titled as an aging nation with the elderly population being over 8% (100 million) and is anticipated to increase to 20% (325 million) by 2050. The elderly population was 20 million, in 1951, and 57 million, in 1991, followed by a sharp increase in 2001.¹ According to observed growth rates for this period, the growth of the 60+ population was more

than that of the total population.¹ Developed countries, such as the United States, are facing the same situation. Since 1900, the percentage of Americans 65 years of age or over has more than tripled (4.1% in 1900 to 12.4% in 2000).² Globally, the most rapidly growing age group consists of individuals aged 80 years or over. This aged population is considered to be less than 2% of the total population, but the number of very old people is expected to increase over the next four decades from less than 90 million in 2005 to almost 400 million in 2050.³

Many years of studies have provided us with evidence of association of oral health and general health. Poor oral health among geriatric patients is inevitable and hence poor oral conditions will have a negative impact on the general health and decrease quality of life.⁴

Oral conditions that are commonly seen among the aged population are edentulism, increase rate of dental caries, high prevalence rate of periodontitis, dry mouth (xerostomia), and oral cancer.⁵ These characteristics are common among geriatric individuals, globally.⁵ The severity of these characteristics depends on the demography, i.e. people residing from developing or from developed countries. The present review has been conducted to evaluate the severity of the oral conditions among aged population residing in developing as well as developed countries.

Research Question

The purpose of the present review is to (a) evaluate the oral health status of geriatric patients, (b) evaluate the dental treatment needs of geriatric patients in developing and developed countries, and (c) compare the oral health status and oral health care for geriatric patients in developing and developed countries.

METHODS

Articles were systematically reviewed using electronic databases (Cochrane central register of controlled trials, MedLine, PubMed, Embase) for studies published from the 1990s to February 2016 using the flowing string of English text terms “oral health status,” “geriatric,” “developing countries,” and “developed countries.” Articles for the review were selected on the basis of their compliance with following criteria:

- Relevant to the topic
- Systematic review related to the abstract/title
- Published in English.

Full copies of the articles were reviewed independently by one reviewer. During the review process, the author and the journals were not blinded by the reviewer, and the entire process was accomplished by one reviewer. The search was concentrated more on original studies related to the topic and limited to the English language. Gray literature was screened systematically.

RESULTS

A total of 21 articles were found, in which 19 articles were related to oral health status, oral health-care needs among elderly residing in developing and developed countries. A total of 12 articles including 1 longitudinal study, 6 cross-sectional studies, and 5 literature reviews were evaluated. All 21 articles were systematically reviewed, and criteria for selection of studies that were evaluated are shown in Figure 1.

Details of the seven selected original studies including the methods, parameters, timeline, and results are

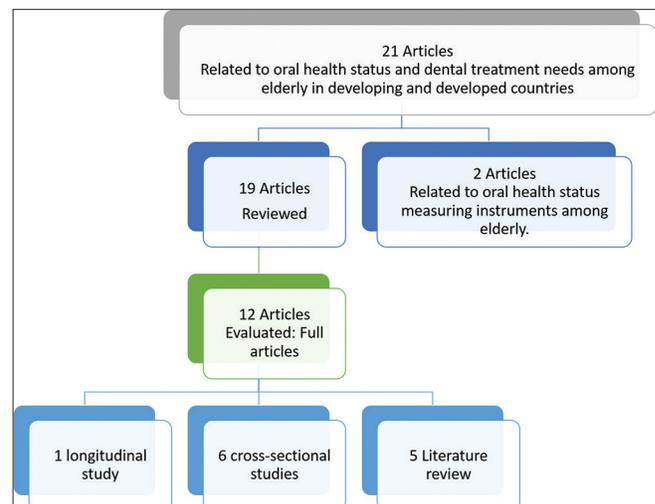


Figure 1: Study selection chart

shown in Table 1. Details of the five selected literature reviews including methods, parameters, timeline, and results are shown in Table 2. All the selected studies have been arranged according to the year in which they are published.

DISCUSSION

There is mounting clinical evidence supporting the rise in geriatric population worldwide with more percentage residing in developing countries.¹ A prominent aspect of population aging is the advancing demographic aging of the older population itself.³ This demographic evolution constitutes a major challenge for health authorities at a global level, particularly of the changes seen in the disease pattern.³

Globally, the poor oral health among geriatric individuals has been displayed, particularly in high levels of tooth loss, dental caries, periodontal diseases, xerostomia, and oral cancer.³ The reasons for tooth loss are usually due to high rate of dental caries and periodontal diseases among elderly.⁵ All these conditions, particularly tooth loss, have been associated with various medical conditions such as hypertension, angina, and diabetes among older people due to alteration of diet.⁸ This proves that poor oral health among older people have a negative impact of the general health of an individual and eventually decreases the quality of life. Risk factors that are associated with poor oral health among aged population are socio-demographic factors (older age, lower education, and lower income), chronic medical conditions (hypertension, angina, arthritis, and asthma), loss of weight and malnourishment, health risk behavior (regular tobacco use, insufficient fruits, and vegetable consumption), and other health-related

Table 1: Details of the original studies evaluated, which are arranged according to the year of publication

Study	Methods	Parameters	Timeline	Results
Petersen, <i>et al.</i> ⁵ (2005) "Improving the oral health of older people: the approach of the WHO Global Oral Health Program"	Longitudinal study	WHO Global Oral Data Bank WHO Oral Health Country/Area Profile Program		Poor oral health among geriatric patients is an important public health burden which needs immediate attention. Clinical and community-based intervention projects are focused to promote oral health care and control prevalence rate of dental caries and periodontal diseases among elderly
Petersen <i>et al.</i> ³ (2010) "Global oral health of older people – Call for public health action"	Cross-sectional Questionnaire study	WHO Global Oral Health Data Bank World Health Survey DMFT Index Periodontal Index		A discrepancy in the pattern of oral health problems experienced by geriatric patients has been found at a global level. In developing countries, about 40% of 65-74 years old report problems while 30% patients of similar age group from high income countries report problems
Shenoy <i>et al.</i> ⁶ (2011) "Dental prosthetic status and prosthetic need of the institutionalized elderly living in geriatric homes in Mangalore: A pilot study"	Cross-sectional study	WHO Oral Health Assessment Form (1997)	11/2009-12/2009	88% of those examined were fully edentulous, and only 12% had complete dentures; none of the study subjects had partial dentures
Suryakant <i>et al.</i> ⁷ (2013) "Dental prosthetic status and prosthetic needs of institutionalized elderly population in old age homes of Jabalpur City, Madhya Pradesh, India"	Descriptive cross-sectional study	WHO Oral Health Assessment Form (1997)	04/2011-06/2011	Over 80% of the study population were partially edentulous, the majority in both arches. Although 18% of the edentulous subjects possessed dentures, over 80% of these subjects needed some form of prosthetic treatment
Peltzer <i>et al.</i> ⁸ (2014) "Prevalence of loss of all teeth (Edentulism) and associated factors in older adults in China, Ghana, India, Mexico, Russia and South Africa"	Cross-sectional study	Study on global aging and adult health questionnaires	2007-2010	The overall prevalence of edentulism was 11.7%, with India, Mexico, and Russia have higher prevalence rates (16.3-21.7%) than China, Ghana, and South Africa (3.0-9.0%)
Agrawal <i>et al.</i> ⁹ (2015) "Assessment of dental caries and periodontal disease status among elderly residing in old age homes of Madhya Pradesh"	Descriptive cross-sectional study	DMFT index CPI	02/2011-06/2011	Prevalence rate of tooth loss is higher among elderly residing in old age homes in India due to lack of knowledge and insufficient oral hygiene instruments provided by the old age homes
Patro <i>et al.</i> ¹⁰ (2016) "Prevalence of dental caries among adults and elderly in an urban resettlement colony of New Delhi"	Cross-sectional study	DMFT index DMFS index	01/2007-02/2007	The prevalence of dental caries in the 35-44 years age-group was 82.4% and it was 91.9% in those ≥60 years

WHO: World Health Organization, CPI: Community periodontal index, DMFT: Decayed, missing, and filled teeth, WHO: World Health Organization

variables (poor cognitive functioning, poor subjective health status, functional disability, and low social cohesion).⁸

Studies reveal that rate of tooth loss is higher among geriatric individuals residing from developing countries than developed countries.⁸ Hence, an urgent and a systematic oral health-care system is required to meet the high demands for it.

In 2005, the World Health Assembly passed a resolution that advised countries to develop an organized health system that allows all people access to needed services.¹⁴ Several developed countries provide their population oral health services and give equal importance to preventive care as well as definitive care.¹⁴ In such countries, the burden of oral disease has been handled by establishing an organized oral care health system that primarily

provides quality treatment services.¹⁴ However, the poor oral conditions among the aged population are still rising which suggest limitations in oral health care in developing countries.^{1,14} Lacks of funding and disproportionate locations of dental professionals are two main barriers of the oral health-care system in developing countries.¹ A considerable gap is noted between resources and population needs in developing countries.³ Most of the dental hospitals are located in urban areas which make dental care inaccessible to older people from rural and remote areas.³ Currently, the dentist-population ratio is 1:10,000 in India,¹ and in Africa, the ratio is approx. 1:150,000 compared to 1:2000 which is the ratio in most industrialized countries.¹⁴ This comparative data displays the limitations faced by the current dental care system in developing countries which will help policy makers and researches to design adequate strategies and direct the resources to those in need.

Table 2: Details of literature review studies evaluated, which are arranged according to year of publication

Study	Method	Parameter	Timeline	Results
Dolan <i>et al.</i> ¹¹ (1993) "Implications of access, utilization and need for oral health care by the non-institutionalized and institutionalized elderly on the dental delivery system"	Literature review			Out-of-pocket expenses, low income and lack of education are some of the barriers to obtain dental care among non-institutionalized older people. Institutionalized older patients cannot access to dental care as they are weak and functionally dependent with lack of transportation
Dolan <i>et al.</i> ¹² (2005) "Access to dental care among older adults in the United States"	Literature review			Dental needs of institutionalized elders are neglected. Low socio-economic status of geriatric patients and declining dentist workforce are two barriers which refrain patients from receiving oral health care
Panchbhai ¹³ (2012) "Oral health-care needs in the dependent elderly in India"	Literature review			The oral health-care system in India is poorly organized. Dependent elderly rely on primary health and community centers, which have limited resources and manpower which causes in percentage of patients with poor oral health status
Kandelman <i>et al.</i> ¹⁴ (2012) "Oral health-care systems in developing and developed countries"	Literature review	WHO Global Oral Health Data Bank World Oral Health Country/Area Profile Program		Analysis shows profound disparities in human and financial resources, dental workforce, and types of trained personnel between developed and developing countries
Singh <i>et al.</i> ¹ (2015) "Addressing geriatric oral health concerns through national oral health policy in India"	Literature review			Lack of resources and finances and disproportionate location of dental professionals are two concerns that need to be addressed to provide quality oral health care

WHO: World Health Organization

Evidence from the selected studies allows us to analyze limitations of the oral health care of institutionalized elderly and compare it with non-institutionalized elderly residing in developing as well as developed countries. Institutionalized elderly are considered to be frail, functionally impaired and suffering from medical disorders¹³ which make them dependent on someone to take care of their oral health.¹³ Developing countries like India have a much disorganized oral health-care system.¹³ 80% of the dental professions provide their services only in urban areas which make it easier for the non-institutionalized elders to receive dental treatment.¹³ Oral health-care services are widely uneven throughout the country which makes it difficult for the institutionalized elders to access them. Dependent elders without any insurance are unable to pay for the expensive dental treatment and would avoid visiting a dentist.¹¹ Lack of transportation is another barrier faced by the institutionalized elders to access oral health care.¹¹ The same situation is being faced by developed countries like the United States.

Published studies from almost two decades have shown that still there has been no improvement in the oral health status among geriatric patients (institutionalized and non-institutionalized) in developing countries when compared to developed countries. In developing countries, regular dental care for geriatric patients has never been given any importance which is why they are suffering from poor oral health. Older people living in

rural areas are likely to be uneducated. Hence, there are usually unaware of the importance of maintaining their oral health. Lack of oral health promotion among these under deserved individuals is also an important barrier that needs to be addressed. The present reviews give us the knowledge about the current oral health status and the limitations and barriers faced by older patients to access quality dental treatment. To conclude, evidence-based research is much needed related to this topic to have a better understanding of an organized oral health status, especially in developing countries like India, which will help to stabilize the situation.

REFERENCES

1. Singh A. Addressing geriatric oral health concerns through national oral health policy in India. *Int J Health Policy Manag* 2015;4:39-42.
2. Vargas CM, Yellowitz JA, Hayes KL. Oral health status of older rural adults in the United States. *J Am Dent Assoc* 2003;134:479-86.
3. Petersen PE, Kandelman D, Arpin S, Ogawa H. Global oral health of older people – call for public health action. *Community Dent Health* 2010;27:257-67.
4. Gil-Montoya JA, de Mello AL, Barrios R, Gonzalez-Moles MA, Bravo M. Oral health in the elderly patient and its impact on general well-being: a nonsystematic review. *Clin Interv Aging* 2015;10:461-7.
5. Petersen PE, Yamamoto T. Improving the oral health of older people: The approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2005;33:81-92.
6. Shenoy RP, Hegde, V. Dental prosthetic status and prosthetic need of the institutionalized elderly living in geriatric homes in Mangalore: A pilot study. *ISRN Dent* 2011;2011:987126.
7. Deogade SC, Vinay S, Naidu S. Dental prosthetic status and

- prosthetic needs of institutionalised elderly population in oldage homes of Jabalpur city, Madhya Pradesh, India. J Indian Prosthodont Soc 2013;13:587-92.
8. Peltzer K, Hewlett S, Yawson AE, Moynihan P, Preet R, Wu F, *et al*. Prevalence of loss of all teeth (edentulism) and associated factors in older adults in China, Ghana, India, Mexico, Russia and South Africa. Int J Environ Res Public Health 2014;11:11308-24.
 9. Agrawal R, Gautam NR, Kumar PM, Kadhiresan R, Saxena V, Jain S. Assessment of dental caries and periodontal disease status among elderly residing in old age homes of Madhya Pradesh. J Int Oral Health 2015;7:57-64.
 10. Patro BK, Ravi Kumar B, Goswami A, Mathur VP, Nongkynrih B. Prevalence of dental caries among adults and elderly in an urban resettlement colony of New Delhi. Indian J Dent Res 2008;19:95-8.
 11. Dolan TA. Implications of access, utilization and need for oral health care by the non-institutionalized and institutionalized elderly on the dental delivery system. J Dent Educ 1993;57:876-87.
 12. Dolan TA, Atchison K, Huynh TN. Access to dental care among older adults in the United States. J Dent Educ 2005;69:961-74.
 13. Panchbhai AS. Oral health care needs in the dependant elderly in India. Indian J Palliat Care 2012;18:19-26.
 14. Kandelman D, Arpin S, Baez RJ, Baehni PC, Petersen PE. Oral health care systems in developing and developed countries. Periodontol 2000 2012;60:98-109.

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