Review Article

Prevalence of Complete Edentulism in Individuals at Least 30 Years Old in Iran since 2000: A Systematic Review

Sayed Shojaedin Shayegh, Saleh Ebrahimi[1], Seyed Mohammad Reza Hakimaneh, Mitra Eisaei

Department of Prosthodontics, Faculty of Dentistry, Shahed University, Tehran, Iran, [1]Faculty of Dentistry, Shahed University, Tehran, Iran

Abstract

Background: The purpose of this study was to systematically review the literature to investigate the prevalence of complete edentulism in Iran. **Method:** An electronic search was performed using three scientific databases: PubMed, Google Scholar, and Irandoc. Moreover, a hand search was performed on theses in the Dental Faculty of Shahed University. Studies published since 2000 were included if they reported on the prevalence of edentulism in Iran in populations at least 35 years old. Eight articles and seven theses were included in the study. **Result:** The reported prevalence of edentulism in Iran ranges from 3% to 78%. **Conclusions:** In this study the reported prevalence has remained stable during the studied period.

Keywords: *Edentulous mouth, Iran, prevalence, tooth loss*

Introduction

Complete edentulism, referring to the condition of loss of all-natural teeth, can be widely seen among the elderly. As the end stage of several oral diseases, edentulism may be indicative of the patient's attitude to and care for teeth. Tooth decay and periodontal diseases are the major causes of tooth loss; of these, decay is more prevalent.[1-4]

Tooth loss significantly reduces chewing efficacy and causes esthetic problems. The number and condition of individuals' teeth can influence their choice of food and diet. Chewing disorders caused by an inefficient dental system can interfere with nutritional intake.[5]

The level of edentulism is related to factors such as age, education level, income, race, obesity, geographical region, use of toothbrushes, and smoking.[6-16] It has been shown that the level of edentulism increases with greater age, weight, and smoking,[3,4,6,8,10-17] and decreases with greater education level, income, and toothbrush use.[2-4,6,7,10-16]

In a systematic review covering the period from 1990 to 2010 throughout the world, Kassebaum *et al*.[17] reported that the highest level of edentulism is observed in individuals at least 65 years of age.

Different findings have been reported on the relationship between gender and edentulism. Hamian *et al*.[3] concluded in 2014 that the prevalence of edentulism was higher in men, while Kassebaum *et al*.[17] could not prove any significant relationship between gender and the prevalence of edentulism.

Numerous studies have been conducted on the prevalence of edentulism in different areas of Iran.[3,4,8,10-14,18-23] However, this is the first review to present their results findings comprehensively. The purpose of the present study is to investigate the prevalence of complete edentulism in Iran since 2000 in populations at least 35 years of age.

Method

Review question

The present study aims at investigating the prevalence of complete edentulism in Iran in individuals at least 35 years of age.

Eligibility criteria

The present study was done in accordance with PRISMA to answer the study question based on population, intervention, comparison, and outcome (PICO). Information was extracted from each included studies on (1) characteristics of study participants

How to cite this article: Shayegh SS, Ebrahimi S, Hakimaneh SM, Eisaei M. Prevalence of complete edentulism in individuals at least 30 years old in Iran since 2000: A systematic review. Int J Prev Med 2021;12:72.

Address for correspondence:
Dr. Seyed Mohammad Reza Hakimaneh, 1417755351, West Italia St., Vesal Shirazi Ave., Keshavarz Blvd., Faculty of Dentistry, Shahed University, Tehran, Iran. E-mail: m.hakimaneh@shahed.ac.ir

Access this article online

Website: www.ijpvmjournal.net/www.ijpvm.ir

DOI: 10.4103/ijpvm.IJPVM_481_19

Quick Response Code:

(including age and nationality [P]); (2) type of study question (prevalence of complete edentulism [I]); (3) the reported results of the study (percentage of complete edentulism [O]).

Search strategy

Three scientific databases, PubMed, Google Scholar, and Irandoc, were searched electronically in October 2018 to find studies on the prevalence of edentulism in Iran. The keywords were selected based on MeSH and non-MeSH keywords in accordance with PICO and the study's question. The MeSH keywords "Iran," and "Tooth loss" and non-MeSH keyword "Edentulous" were searched for in PubMed, the MeSH keyword "Iran" and the non-MeSH keyword "Edentulism" were searched for in Google Scholar, and the Persian translations of "Edentulous," "Iran," and "Tooth loss" were searched for in Irandoc. Moreover, a hand search was performed on theses in the Dental Faculty of Shahed University. The full text of the selected studies was then obtained.

Inclusion and exclusion criteria

The title of each of the obtained articles and theses was examined with regard to the inclusion criteria. The inclusion criteria were age over 35 years, reporting the prevalence of complete edentulism in the paper, and the search was performed among Iranian people. Afterward, the abstract of each study whose title met the criteria was studied. This procedure was carried out by a senior dentistry student (S.E.) under the supervision of a prosthodontics specialist on faculty at the university, (S.M.R.H., S.S.S., and M.E.). This review includes studies on the prevalence of edentulism in Iran in populations at least 35 years of age. The language of the study had to be either Persian or English. Studies were excluded if they included any subjects younger than 35 years or if their full text was not accessible.

Data extraction

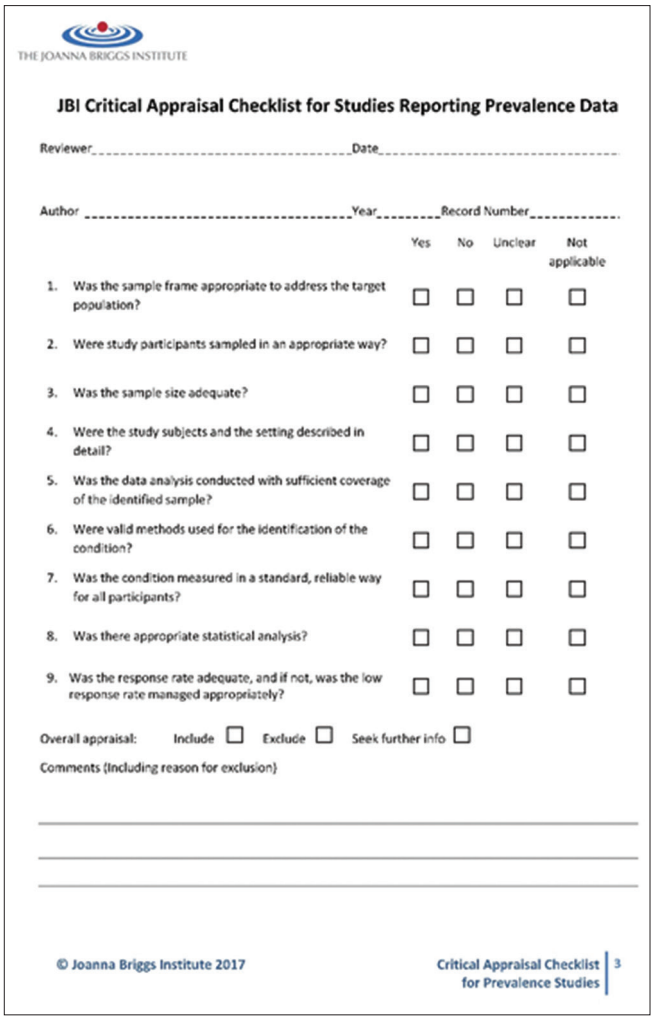
The information extracted from the studies included the first author, year of publication, study location, study design, study population, the prevalence of edentulism, sample size, and age.

Quality evaluation of selected studies

All articles were classified according to the Joanna Briggs Institute (JBI) scale.[24] Two referees (S.S.S. and M.E.) evaluated selected papers independently and disagreements were decided by consensus after a discussion. More information regarding the evaluated items can be found in Figure 1.

Results

A total of 837 studies (include 15 theses and 825 articles) were obtained while searching the databases. A total number of 132 articles were excluded for being duplicated and



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JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data

Reviewer_____ Date_____

Author _____ Year_____ Record Number_____

	Yes	No	Unclear	Not applicable
1. Was the sample frame appropriate to address the target population?	☐	☐	☐	☐
2. Were study participants sampled in an appropriate way?	☐	☐	☐	☐
3. Was the sample size adequate?	☐	☐	☐	☐
4. Were the study subjects and the setting described in detail?	☐	☐	☐	☐
5. Was the data analysis conducted with sufficient coverage of the identified sample?	☐	☐	☐	☐
6. Were valid methods used for the identification of the condition?	☐	☐	☐	☐
7. Was the condition measured in a standard, reliable way for all participants?	☐	☐	☐	☐
8. Was there appropriate statistical analysis?	☐	☐	☐	☐
9. Was the response rate adequate, and if not, was the low response rate managed appropriately?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

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Critical Appraisal Checklist for Prevalence Studies | 3

Figure 1: JBI critical appraisal checklist

705 articles remained. Afterward, 646 articles whose title was not suitable were excluded. Once the age limitation was applied, six articles entered the final investigation. In addition, seven theses identified by a hand search were included in the study. Figure 2 shows the number of studies that remained in each step of the search. Table 1 describes the main characteristics of the studies included in the review (n =13).

Discussion

Results of six articles and seven theses were investigated in this review. The prevalence of edentulism in Iran is reported to be between 3% and 78%.

In a nationwide study conducted by Hessari *et al*.[19] (2008) on samples between 35 and 44 years old, the prevalence of edentulism in Iran was reported by 3%. In 2002, Halvachi[10] studied 400 individuals in the catchment districts of Tehran University of Medical Sciences using random cluster sampling. They introduced the sample as representative of Tehran City. The prevalence of complete edentulism is reported to be 28% in this study. In

addition, they state that smoking increases the prevalence of edentulism, whereas education level, income and toothbrush use are all associated with a lower prevalence of edentulism. Also in 2002, Hemmatzade[16] investigated 400 participants in the area of Iran University of Medical Sciences using random cluster sampling and described the sample as representative of Tehran City. In this study, the prevalence of complete edentulism is 21.5%. Furthermore, the prevalence of edentulism is reported to be positively correlated with age and smoking and negatively correlated with education level, income, and toothbrush use. 10 years later, in 2012, Amri[14] investigated 400 individuals in the whole of Tehran City using random cluster sampling and reported the prevalence of edentulism to be 27% in Tehran. They also conclude that the prevalence of edentulism was not related to gender and marital status. They also state that as education level and income increase, the prevalence of edentulism is reduced, and as age and smoking increase, the prevalence of edentulism increases. The difference between the reported prevalence of edentulism in Tehran between Halvachi, Hemmatzade, and Amri studies could be related to the different ways they used to sample from the Tehran population.

Figure 2: Flowchart of the selection of studies for the review

In 2001, Dashti[13] investigated 397 individuals in Bushehr by random cluster sampling and reported the prevalence of edentulism to be 29%. In this study, influential factors in edentulism such as age, gender, marital status, education level, income, tooth brushing, and smoking were studied. The prevalence of edentulism was positively associated with age, smoking, and not brushing teeth and negatively associated with income and education level. Gender and marital status have no effects on the prevalence of edentulism.

In the same year, Nemati[11] investigated 420 individuals in Kermanshah using random cluster sampling and reported the prevalence of complete edentulism to be 31.9%. They found that age and smoking were associated with a higher prevalence of edentulism. In addition, higher income and education levels were associated with a lower prevalence of edentulism.

In 2002, Tebyani[15] investigated 400 individuals in Bushehr. They performed random cluster sampling. The prevalence of complete edentulism was announced as 29.2% in this study. They found that age and smoking are associated with a higher prevalence of edentulism, whereas higher educational levels, higher income levels, and tooth brushing are associated with a lower prevalence of edentulism.

In 2002, Yarmohammadi[12] carried out a similar study in Hamedan. They studied 345 individuals using random sampling and reported a prevalence of 40.9%. It was found in this study that tooth brushing and higher income and education levels are associated with a lower prevalence of edentulism, and age and smoking are associated with higher prevalence.

In 2009, Rabiei[25] carried out a study on individuals above 65 years old who had been referred to the primary

Table 1: Characteristics of the studies included in the review

Number	Author	Year	Location	Study design	Reference type	Sample size	Age	Prevalence (%)
1	Dashti[13]	2001	Booshehr	Cross-sectional	Thesis	397	≥35	28
2	Nemati[11]	2001	Kermanshah	Cross-sectional	Thesis	420	≥35	31.9
3	Halvachi[10]	2001	Tehran	Cross-sectional	Thesis	400	≥35	28
4	Hemmatzade[16]	2001	Tehran	Cross-sectional	Thesis	400	≥35	21.5
5	Tebyani[15]	2001	Behshahr	Cross-sectional	Thesis	400	≥35	29.2
6	Yarmohammadi[12]	2002	Hamedan	Cross-sectional	Thesis	345	≥35	40
7	Hessari *et al*.[19]	2008	Iran	Cross-sectional	Article	8240	35-44	3
8	Majdzade *et al*.[21]	2011	Yasooj	Cross-sectional	Article	400	≥35	27
9	Rabiei *et al*.[25]	2012	Talesh	Cross-sectional	Article	203	≥65	78
10	Amri[14]	2012	Tehran	Cross-sectional	Thesis	400	≥35	27
11	Hamian *et al*.[3]	2016	Qom	Cross-sectional	Article	394	≥35	23.9
12	Rashidi-Meybodi, *et al*.[22]	2016	Yazd	Cross-sectional	Article	251	≥61	66.1
13	Khosrozadeh *et al*.[26]	2017	Kashan	Cross-sectional	Article	440	35-60	17.3

health care centers in Talesh. The prevalence of complete edentulism among individuals above 65 years old was reported to be 78% in this study. One of its limitations was that the investigation was done just on the health centers, which affects people's conditions, so the results are not generalizable to the overall population.

In 2014, Hamian[3] carried out a study on people above 35 years old referring to the selected clinics in Qom. A total number of 394 participants were randomly investigated in their study and the prevalence of complete edentulism was 23.9%. One of the limitations of this study is that the investigation was only conducted on dentistry clinics, so the findings are not representative of the general population in Qom.

The present research included limitations such as the fact that the resources used in this review were cross-sectional. Consequently, unwanted factors may well exist that can affect the results. In addition, the age range included in some of these studies was not identical to those considered, few studies have been conducted on this issue in Iran, and not all risk factors have been investigated in this regard.

Conclusions

The prevalence of complete edentulism is reported between 17.3% in Kashan up to 78% in Talesh. In the nationwide study that evaluates the prevalence of complete edentulism in Iran in 2008, the result was reported to be 3%. The new researches suggested evaluating the change in the past 12 years.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Received: 26 Dec 19 **Accepted:** 24 Feb 20
Published: 25 Jun 21

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