

# Prevalence of Cardiovascular Diseases among Complete Denture Patients

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## Abstract

Cardiovascular diseases are conditions causing blocked or narrowed blood vessels leading to chest pain, myocardial infarction or stroke. Sometimes it can be associated with dental diseases like caries, periodontal disease leading to tooth loss. In the present study, we assessed the prevalence of cardiovascular diseases among Complete denture (CD) Patients. Patient records were collected by complete analysis of data of 86000 patients between March 2019 to March 2020. The data on the patient's medical history and treatment were extracted from the patient's records and reviewed. Totally 421 case sheets were collected and used for our study. The collected data were entered in excel and transferred to SPSS for analysis by Chi square test. We found that 1.19% of complete denture patients were affected with cardiac problems and all the affected patients were males. Among them, 0.71% of patients between the age group 51 to 70 years were more commonly affected with cardiac problems. In the present study, we found that cardiac problems are statistically not significant ( $p>0.05$ ). Though the association of cardiac problem between age and gender was found to be statistically not significant, we found that patients (especially males) between 51-70 years were more commonly affected by cardiac problems.

**Keywords:** Complete denture, Cardiac, Prevalence, Tooth loss, Systemic.

## Introduction

Cardiovascular diseases are the conditions that involve blocked vessels or narrowed vessels leading to heart attack, stroke, chest pain, cardiovascular diseases including coronary heart disease, cerebrovascular disease, congenital heart diseases<sup>1</sup>. Cardiovascular disease can also be associated with tooth loss.

Edentulism is the condition of being toothless due to loss of tooth. Edentulousness is caused by various factors. It is caused due to periodontal problems, caries,

extraction due to poor prognosis of tooth<sup>2</sup>. Sometimes edentulousness can also be associated with systemic disorders like diabetes, hypertension, or cardiac problems. Several studies were done to determine the association between systemic diseases and tooth loss<sup>3,2,4</sup>.

Some studies have stated that it can be due to poor nutritional status or inflammatory responses associated with past periodontal diseases<sup>5</sup>. The main etiology behind tooth loss is periodontal diseases. A dental plaque marks the beginning of periodontal irritation and different elements (which include systemic and nearby factors) can affect the prevalence and severity of periodontal diseases<sup>6</sup>. The periodontal diseases and tooth loss can be due to systemic diseases also. Sometimes tooth loss can occur due to drug overdose<sup>7,2</sup>.

One of the main objectives in selecting and arranging artificial teeth is to produce a prosthesis that defies detection<sup>8</sup>. Removable dentures replace missing natural teeth thereby restoring function and aesthetics

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it may be partial or completely edentulous patients. Complete denture is used as treatment of edentulousness<sup>9</sup>. Recently fixed prosthesis is more popular than removable prosthesis due to comfort, function and aesthetics<sup>10</sup> and the implants are getting more popular in terms of fixed prosthesis it may be complete or partial edentulousness but its success depends on many factors one of its success depends on its marginal fit<sup>11</sup> and abutments retaining the superstructure or prosthesis<sup>12</sup>. Similarly in cases with severe bony defects grafting is required before implant placements but alternatively lip bumpers help in covering up the defect<sup>13,14</sup>. In treatment aspect implant<sup>15,16</sup> and all ceramic restorations<sup>17 18</sup> are widely used but in case of compromised periodontium, RPDs and Complete dentures are widely used. Though so many treatment options are available, knowledge on every aspect is very much essential. In this study we are going to assess the prevalence of cardiovascular diseases among Complete denture (CD) patients.

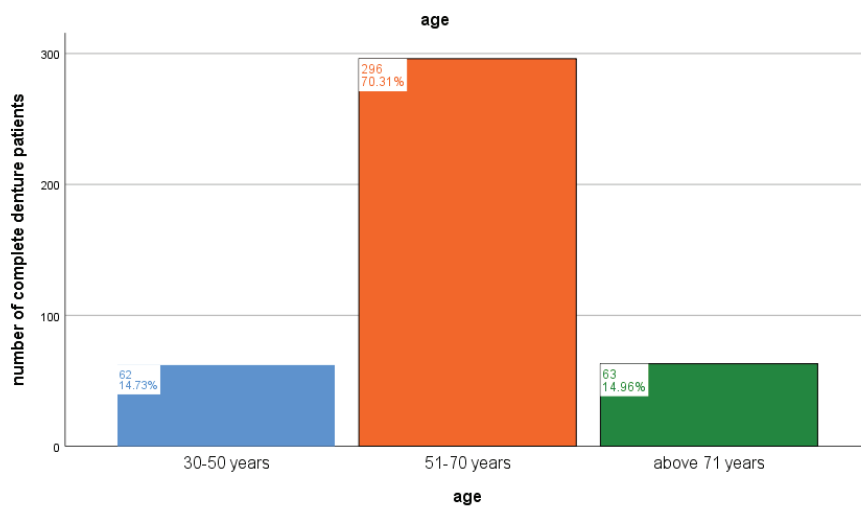
### Materials and Methods

The present study is a retrospective study. Patient records were collected by complete analysis of data of 86000 patients who visited Saveetha Dental College and Hospitals in between March 2019 to March 2020. The sample size for the present study was 421 patients who underwent CD treatment. The required data (patients

wearing complete denture, their age, gender, treatment and medical history) were extracted from the patient's records and reviewed. The patients were grouped into 3 on the basis of age as 30-50 years, 51-70 years and above 71 years. The collected data were transferred to SPSS for analysis. Chi square test was used to detect the significance between age, gender and history of cardiac problems in Complete denture patients. p value less than 0.05 was considered to be statistically significant. The data was analysed and tabulated.

### Results and Discussion

Patients were segregated according to their age and gender. Patients were grouped according to their age as 30-50 years, 51-70 years and above 71 years [Figure 1]. Among 421 patients, 252 were males and 169 were females [Figure 2]. We found that only 1.19% of patients were affected with cardiac problems [Figure 3] and all of them are males [Figure 5]. No female patients were affected with cardiac problems [Figure 5]. Among those 1.19% patients, 0.71% of patients between the age group 51-70 years were affected with cardiac problems [Figure 4]. We compared age with cardiac problems and found that it is not significant ( $p > 0.05$ ) [Figure 4]. Similarly we compared gender with cardiac problems and found that it is also not significant ( $p > 0.05$ ) [Figure 5]. From the results we found that cardiac problems are less prevalent in Complete denture patients.



**Figure 1: Frequency distribution of different age groups. X axis denotes age group and Y axis denotes number of complete denture patients. Blue denotes 30-50 years, orange denotes 51-70 years, green denotes above 71 years. 14.73% were between 30-50 years, 70.31% were between 51-70 years, 14.96% were above 71 years. Majority of the patients affected with cardiac problems were between 51-70 years of age (0.71%).**

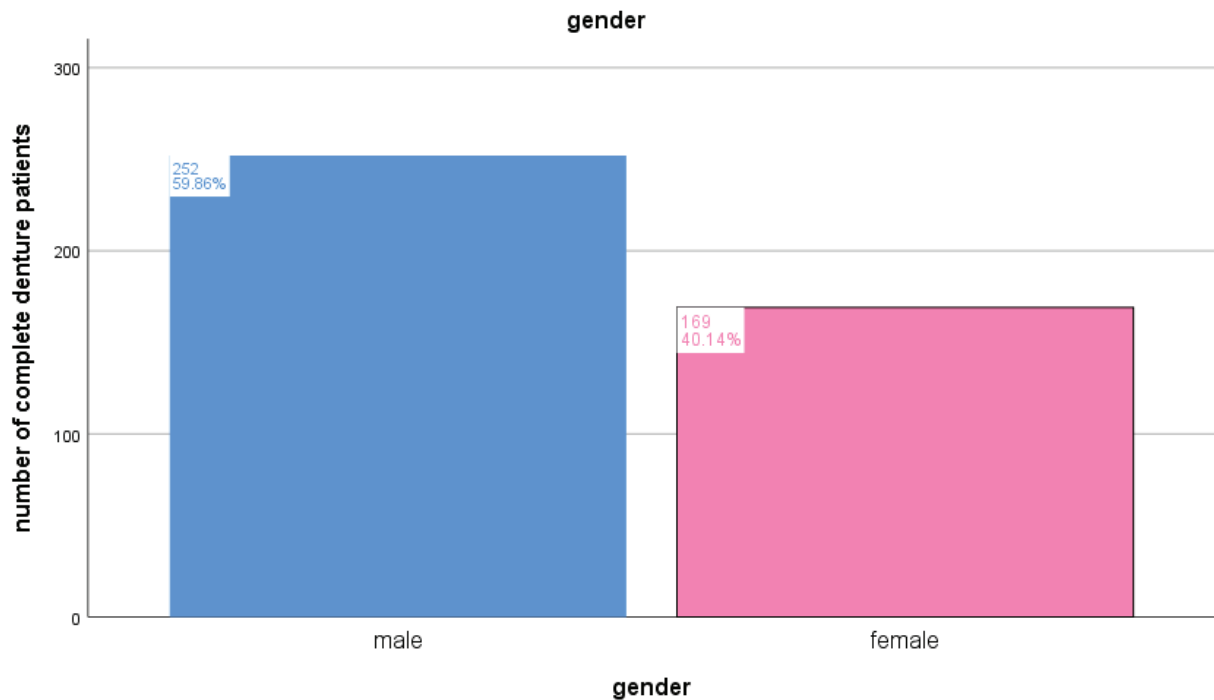


Figure 2: Frequency distribution of gender. X axis denotes gender and Y axis denotes number of complete denture patients. Blue denotes males, pink denotes females. 59.86% were males and 40.14% were females. Male population is more commonly affected with cardiac problem (1.19%).

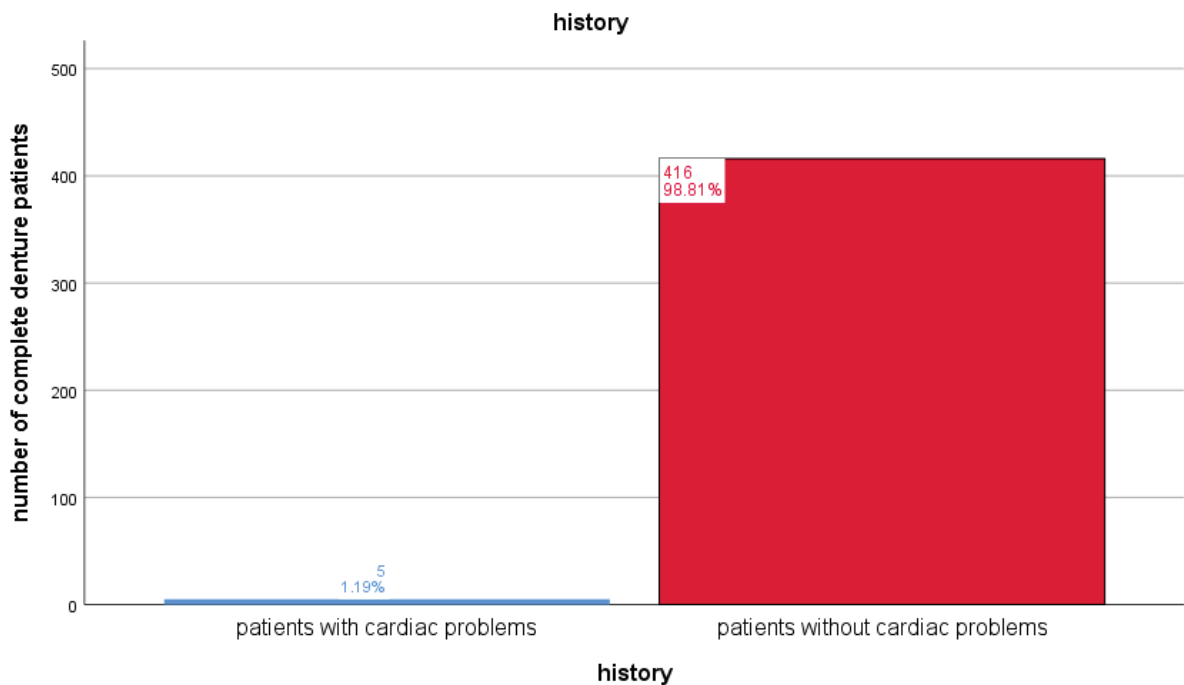
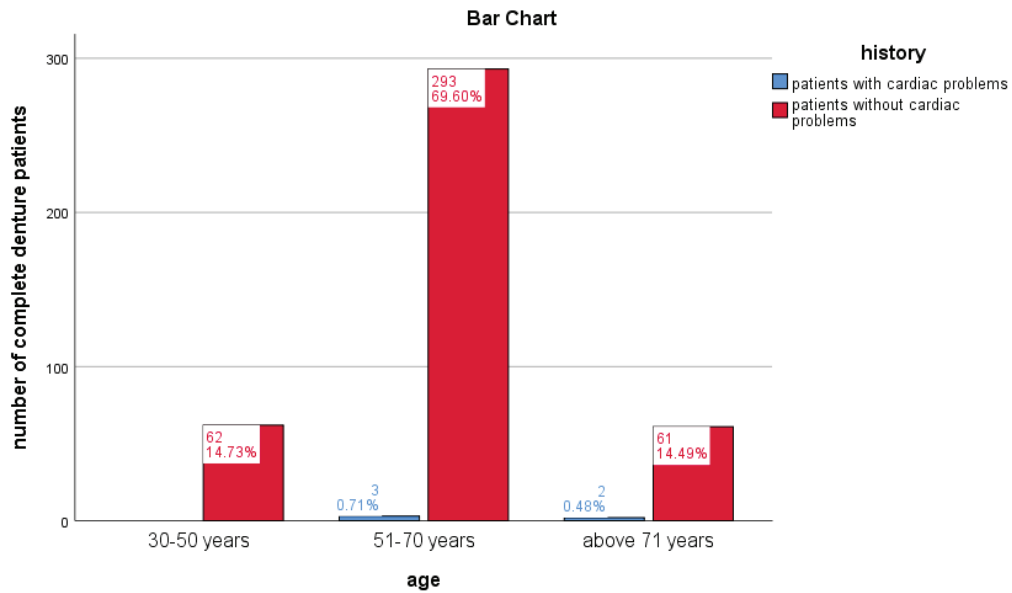
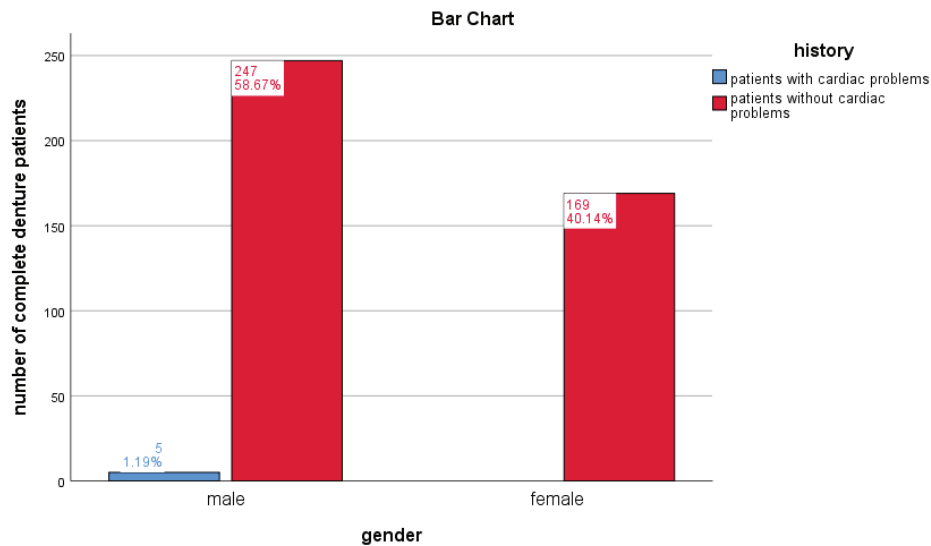


Figure 3: Frequency distribution of history of cardiac problems. X axis denotes history of cardiac problems and Y axis denotes number of complete denture patients. Blue denotes patients with cardiac problems, red denotes patients without cardiac problems. From the above graph we found that 1.19% of complete denture patients were affected with cardiac problems whereas 98.81% of complete denture patients were not affected with cardiac problems. Thus cardiac problems are less prevalent in complete denture patients.



**Figure 4:** Bar chart representing the association between age and history of cardiac problem. X-axis denotes age and Y-axis denotes number of complete denture patients. Blue denotes complete denture patients with cardiac problems, red denotes complete denture patients without cardiac problems. Patients between the age group 51-70 years (0.71%) were more commonly affected with cardiac problems. None of the patients between the age group 30-50 years were affected. Chi square test was done and the association between age group and history of cardiac problem was found to be statistically not significant. p value obtained is 0.230 which is statistically not significant ( $p > 0.05$ ). Though it is statistically not significant, we found that patients between 51-70 years were commonly affected by cardiac problems.



**Figure 5:** Bar graph representing association between gender and history of cardiac problem. X-axis denotes gender and Y-axis denotes number of complete denture patients. Blue denotes the complete denture patients with cardiac problems and red denotes the complete denture patients without cardiac problems. Males were predominantly affected by cardiac problems (1.19%) and there is no sign of cardiac problem in females. Chi square test was done and the association between gender and history of cardiac problem was found to be statistically not significant. p value obtained is 0.065 which is statistically not significant ( $p > 0.05$ ). Though it is statistically not significant, we found that male patients were commonly affected by cardiac problems.

Similar studies were done by other researchers. In the study conducted by Taraszkievicz - Sulik Katarzyna et al they reported that age is not statistically significant and males are more prevalent, similar to the present study<sup>19</sup>. In the study conducted by Fei Cheng et al, they found a stronger association between tooth loss and cardiovascular disease, contrary to the present study; they also found that males are more prevalent, similar to the present study<sup>20</sup>.

In the study conducted by Dr.M.Vijay Anand et al, they found that cardiac problems are second prevalent<sup>21</sup>. A study conducted by Hosseini et al showed that edentulism is more common in patients with diabetes and heart disease<sup>22</sup>. A cross-sectional study conducted by Ozturk Tonguc Maine et al showed that cardiac disorders and endocrine disorders were observed significantly higher in patients with tooth loss<sup>23</sup>. The study conducted by Bahekar et al showed that patients with periodontitis have higher risk of developing Coronary heart disease<sup>24</sup>.

Tooth loss is associated with an increased risk of vascular diseases like coronary heart disease and cerebrovascular disease. Tooth loss may lead to dietary pattern change, resulting in an increased risk of hypertension because the change of dietary pattern may be associated with hypertension<sup>25,21</sup>. Hypertension may be a risk factor linking tooth loss and vascular disease in postmenopausal women<sup>26</sup>.

Tooth loss is also independently associated with aortic valve stenosis<sup>27</sup>. Some studies showed that edentulousness causes poor masticatory function and this may be a reason behind systemic diseases due to poor nutritional status<sup>28</sup>. In the study conducted by Hsin-Chia Hung et al, they found that men with tooth loss are at higher risk of coronary heart disease<sup>29</sup>. Some studies showed that tooth loss is associated with diabetes mellitus, cardiovascular disease or a combination of both<sup>30</sup>. Some studies showed that oral diseases like gingivitis, denture sore mouth can cause cellulitis which may lead to heart disease<sup>31,32,18</sup>.

### Conclusion

According to the present study, we found that cardiac problems are less prevalent in complete denture patients. Cardiac problems were mostly observed in the age group of 51-70 years and common in male population. The

present study includes only a small sample size and it is a single centered study. In future, the present study can be done with a larger population with other systemic diseases included.

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**Ethical Clearance:** It is taken from “Saveetha Institute Human Ethical Committee” (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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