

Awareness and knowledge of oral manifestations in cardiovascular diseases among the general public

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ABSTRACT

Cardiovascular diseases (CVDs) are disorders affecting the heart and blood vessels. Periodontal problems, bleeding gums, dry mouth, and gingival hyperplasia are common oral manifestations seen in cardiovascular-related problems. To assess the extent of awareness and knowledge, the general public has toward the oral manifestation related to that of CVDs. A questionnaire was distributed among the general public in relation to that of the extent of awareness and knowledge of oral manifestations with regard to CVD. A total of 161 responses were collected from the survey. The collected data were compiled and analyzed by the SPSS software; the Pearson Chi-square test was done where $P < 0.05$ was considered statistically significant. The study showed that 65.22% of the population is aware of the types of CVD. About 59.63% of the population do not know that periodontal problems lead to cardiovascular problems. About 39.75% have vague knowledge about the maintenance of poor oral health causing cardiovascular problems. The study concluded that the general public is not much aware of the oral manifestations related to that of CVDs.

Key words: Cardiovascular disease, general public, innovative technology, knowledge and awareness, novel method, oral manifestations

INTRODUCTION

The human body is composed of several systems of components, whose biological processes are interrelated, and any alteration in one part can produce an impact on the other. Inflammatory reactions can affect oral diseases like periodontitis to systemic disorders like atherosclerotic cardiovascular disease (CVD).^[1] CVD is a group of diseases affecting the blood vessels or heart.

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CVD includes coronary artery disease such as myocardial infarction and angina, and other CVD includes stroke, heart failure, and rheumatic heart fever.^[2]

Periodontal diseases are connected with the widespreadness of CVD with increasing evidence.^[3] It is a chronic inflammatory disease attacking bone and tissue which supports the tooth. It is due to the response of the body to the infection of bacteria including the oral cavity and the dental plaque causing loss of the tooth.^[4] Periodontitis is the predominant health problem of the public and it contributes to the worldwide chronic oral diseases burden and is also a major public health problem globally.^[5] Augmenting the situation causes severe effects on the oral cavity due to the various medications employed for treating atherosclerotic CVD including that of xerostomia or dry

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mouth, taste disturbances, and hyposalivation.^[6] Statements of international consensus recognize the importance of the association between oral manifestations and CVD and recommend a preventive oral health approach to be adopted in the settings of cardiac care and that every patient having CVD engage in preventive oral health practice and engage in regular dental care for reducing cardiovascular risk.^[7]

In a previous study done on 150 adult Iranian heart patients, the author found poor practices in oral health and moderate knowledge of the patients.^[8] Most of the studies focused on children or their parents or caregivers showed the low oral health status of the children and their parent's insufficient knowledge.^[9] Although many studies have been done on understanding the mechanism of oral manifestations with CVDs. Very minimal studies are done assessing the knowledge and awareness of the general public with that of oral manifestations, leading to cardiovascular problems. Overall, the research is important in understanding the oral health condition, knowledge, and behaviors of adults with CVD with their oral manifestation to provide better treatment. Our team has extensive knowledge and research experience that has translated into high-quality publications.^[10-29]

This study aimed to assess the extent of knowledge and awareness of the general public of the oral manifestation related to CVD.

MATERIALS AND METHODS

Study design

A survey-based study was conducted at Saveetha dental college and hospital, Chennai, to evaluate the extent of awareness and knowledge the general public have toward the oral manifestations related to CVDs.

Sampling technique

This study used nonprobability convenient sampling to minimize the sampling bias, the time duration was shortened, the use of simple language, and difficult concepts were avoided.

Data collection and tabulation

- Self-structured questionnaires were prepared in relation to the extent of knowledge and awareness the general public have towards the oral manifestations related to CVDs
- Age group from below 18 years and above 60 years were excluded from the study
- The total of 161 responses including the gender of responses was extracted
- The collected results were evaluated and tabulated.

Statistical analysis

The data were collected, validated, and analyzed with the SPSS version 26, and results were obtained. Variables were

expressed as percentage and frequency. Chi-square test was employed to test associations between the variables. $P < 0.05$ was considered significant statistically.

RESULTS

A set of questionnaires were prepared in relation to that of the extent of knowledge and awareness the general public has toward the oral manifestations related to that of CVDs. A total of 161 responses were collected from the general public. The results were compiled and analyzed showing 65.22% of the population aware of the types of CVDs. About 59.63% of the population do not know that periodontal problems lead to cardiovascular problems. About 39.75% have vague knowledge about the maintenance of poor oral health causing cardiovascular problems. Pearson Chi-square test showed $P < 0.05$, providing the data significant statistically.

DISCUSSION

CVD is one of the leading causes of morbidity and mortality in industrialized countries.^[30] Based on the WHO reports, 31% of global deaths are due to cardiovascular problems.^[31] The risk factors for CVD include obesity, tobacco, family history, diabetes, poor dietary intake, and limited physical activity.^[32] Moreover, there is increasing evidence that certain oral manifestations are a potential risk factor causing cardiovascular problems.^[33]

Figure 1 shows that 65.22% of the population were aware of the various CVDs. In contrast to the current results, in an earlier study done by Fox *et al.*^[34] recorded 36% of the population not aware of cardiovascular problems. The change in the current study results could be due to the increase in advertisements over the awareness of health-related issues, people are aware of common

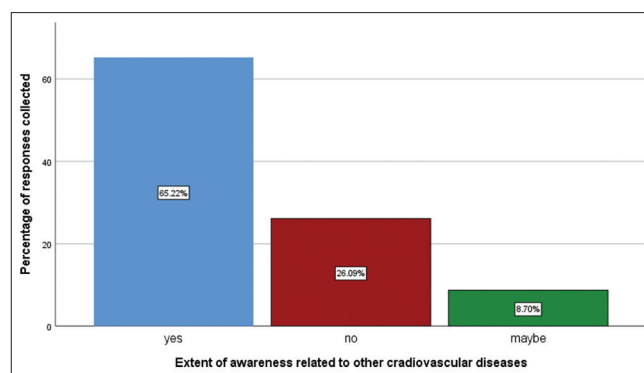


Figure 1: This graph shows the responses collected to the questions of whether the general public is aware of various other cardiovascular diseases. The X-axis indicates the options provided for the question and Y-axis indicates the percentage of responses obtained. Where blue denotes 65.22% of response collected for yes, red denotes 26.09% of responses, and green denotes 8.70% of responses collected for maybe

health-risking diseases [Figure 2]. About 59.63% of the general public are not knowledgeable about periodontal problems, leading to CVD. Contrary to current results, in a previous study done by Kumar *et al.*,^[35] the author found that the knowledge regarding periodontal problems, leading to CVDs was higher when compared to another study by Kjellström *et al.*^[36] showed that people were not aware of periodontal problems that have the potential to cause CVDs [Figure 3]. About 39.75% of the public are not much aware that improper oral hygiene could lead to cardiovascular problems. In a previous study conducted by the American Heart Association found that improper oral hygiene is a stronger predictor of heart-related issues than any other potential markers.^[37] Figure 4 shows that 30.43% of males and 29.19% of females are not aware of the oral manifestations, leading to CVDs, related results

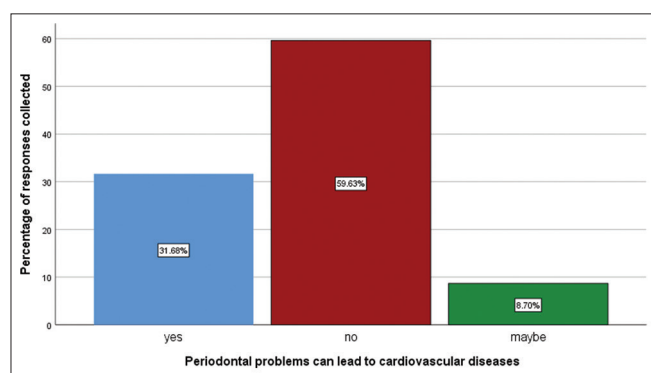


Figure 2: A bar graph in relation to the response collected for the questions of whether the general public is knowledgeable regarding the periodontal problems that could lead to cardiovascular disease. The X-axis indicates the options provided for the question and Y-axis indicates the percentage of responses obtained. Blue denotes 31.68% of responses collected for yes, red denotes 59.63% collected for no, and green denotes 8.70% of responses for maybe

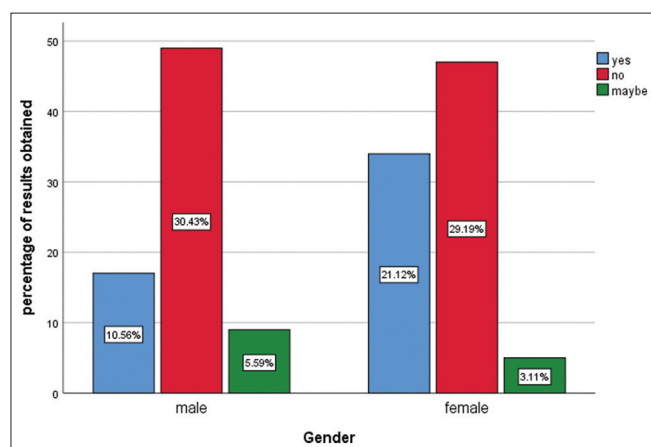


Figure 4: Correlation graph between the gender and the responses collected on the extent of awareness they have over the changes seen in the oral cavity, leading to cardiovascular diseases. The X-axis indicates the gender responses provided and the Y-axis indicates the percentage of responses obtained. Pearson Chi-square test was done and the $P = 0.04$ ($P < 0.05$), hence significant statistically

were obtained in a study done by Ferguson reported that people are not aware of the potential risk factors seen in the oral cavity, leading to cardiovascular problems.^[38] Figure 5 shows that 30.43% of the male respondents and 29.19% of female respondents are not knowledgeable about periodontitis problems that pose a threat to CVDs. Padilla *et al.* reported periodontal pathogens isolated from that of cardiovascular patients.^[39]

This study was conducted in a short duration period and accordingly collected responses were fewer. The result of the current study was based on the responses from the general public on oral manifestations related to CVD. Although the questions covered a gamut of important areas, no in-depth probing could be carried out. This study provides a better understanding of the importance of maintaining proper oral hygiene to maintain healthy living.

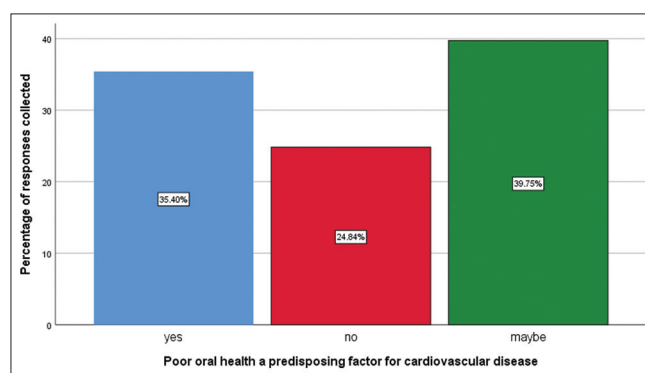


Figure 3: Bar graph for responses collected for the questionnaire on the extent to which the general public is aware that poor oral health can lead to cardiovascular problems. Where the X-axis indicates the options provided for the question and the Y-axis indicates the percentage of responses obtained

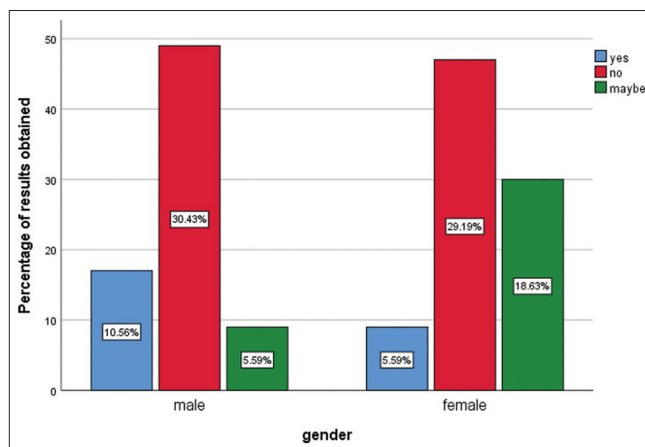


Figure 5: The association of gender with the responses collected for the question on the extent of knowledge the general public has towards the periodontitis problem causing cardiovascular problems. The X-axis indicates the gender options provided and the Y-axis indicates the percentage of responses obtained. Pearson Chi-square test was done and $P = 0$ ($P < 0.05$), hence significant statistically

CONCLUSION

The study concludes that the general public is not much aware of the oral manifestations related to cardiovascular problems. Awareness programs and dental educational camps need to be conducted to create awareness of the oral manifestation of CVDs in the community.

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Conflicts of interest

There are no conflicts of interest.

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