

Awareness about poor oral health and its interrelationship with different systemic diseases among nursing fraternities - A crosssectional survey

Abstract:

Poor oral health has long been associated with systemic diseases such as cardiovascular conditions, diabetes, and respiratory infections, largely due to chronic inflammation and the spread of oral bacteria into the bloodstream. Awareness of this relationship is especially important among nursing professionals, as they play a key role in patient education and health promotion. This study assessed nurses' knowledge regarding the correlation between oral health and systemic diseases through a 20-item questionnaire administered to 162 participants. Data were analyzed using SPSS Version 22 (IBM, USA). The findings revealed a positive attitude and satisfactory awareness among nurses regarding oral-systemic health links, highlighting the need to further strengthen interdisciplinary collaboration between nurses and dental professionals to improve overall health outcomes.

Key-words: Periodontal disease, Chronic systemic conditions, Interprofessional healthcare, Oral hygiene practices.

Introduction:

Oral health is an essential component of general health, contributing to overall well-being, quality of life, and systemic disease prevention. The World Health Organization (WHO) defines oral health as being free from chronic oral and facial pain, oral and throat cancer, oral infection and sores, periodontal disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being[1]. Despite its significance, oral health is often neglected, especially in non-dental healthcare sectors. This neglect can have far-reaching implications as poor oral health does not remain localized—it has been increasingly recognized as a risk factor for a number of systemic diseases[2].

Scientific research over the past few decades has established a strong bi-directional relationship between oral health and systemic health. Periodontal disease, a chronic inflammatory condition affecting the supporting structures of teeth, has been associated with systemic diseases such as cardiovascular disease, type II diabetes mellitus, chronic obstructive pulmonary disease (COPD), pneumonia, adverse pregnancy outcomes (such as preterm low birth weight), rheumatoid arthritis, osteoporosis, and even cognitive decline[3,6] The

mechanisms underlying these associations include the entry of pathogenic bacteria into the bloodstream from infected periodontal tissues (bacteremia), as well as the systemic spread of pro-inflammatory mediators such as interleukins and C-reactive proteins[7,8]

Given these complex interrelationships, the role of healthcare professionals in the early identification, education, and management of oral health problems becomes paramount. Nurses, in particular, are critical to this effort due to their

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extensive patient interaction and holistic approach to care. They frequently engage with patients across all age groups, from pediatric to geriatric populations, and across different settings, including hospitals, community health centers, and long-term care facilities. This makes them key players in promoting awareness about the oral-systemic health connection and integrating oral health assessments into routine clinical practice[9,10]

However, a consistent challenge in leveraging nursing potential for oral health promotion is the lack of adequate knowledge and training regarding oral-systemic disease interrelationships. Traditionally, nursing curricula have placed limited emphasis on oral health, often treating it as a peripheral topic rather than an integral part of patient care[11].

As a result, many nursing professionals may lack the confidence or clinical competence to perform oral health assessments, provide patient education on oral hygiene practices, or identify signs of systemic disease related to oral infections. This knowledge gap, if not addressed, can hinder the holistic delivery of care and contribute to delayed diagnosis and suboptimal health outcomes[12].

In developing countries like India, where the burden of both oral and systemic diseases is high, this issue is even more pressing. Limited access to dental services, lack of oral health literacy among the general population, and the disproportionate focus on curative rather than preventive care further exacerbate the problem[13]. In such contexts, empowering nursing professionals with the necessary awareness and knowledge can serve as a cost-effective and sustainable strategy to enhance oral-systemic health integration[13].

Therefore, it becomes crucial to assess the current level of awareness among nursing fraternities regarding the impact of poor oral health on systemic diseases. By identifying existing knowledge gaps, training needs, and attitudinal barriers, appropriate educational interventions can be designed to improve nursing practice and interdisciplinary collaboration between medical and dental professionals.

This cross-sectional survey aims to evaluate the awareness, perceptions, and practices related to oral-systemic health among nursing professionals. The findings of this study are expected to highlight the necessity of integrating oral health into nursing education and continuing professional development programs. Ultimately, strengthening nurses' roles in oral health promotion can lead to improved patient outcomes, reduced healthcare costs, and a more unified approach to holistic health care delivery.

Material & Method:

This questionnaire-based cross-sectional survey was undertaken among a total of 162 nursing students from rohailkhand nursing college. The primary objective of the study was to evaluate the level of awareness and understanding regarding the association between poor oral health and various systemic diseases among future healthcare providers.

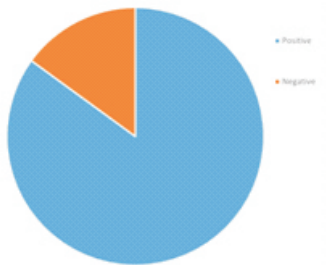
A structured, self-administered questionnaire consisting of 20 multiple-choice questions was developed specifically for this purpose. The questionnaire was divided into sections addressing different domains, including general knowledge about oral health, awareness of oral-systemic links, understanding of specific diseases associated with poor oral hygiene (such as cardiovascular disease, diabetes mellitus, respiratory infections, and adverse pregnancy outcomes), and attitudes toward oral healthcare in clinical practice.

Participants were instructed to select the most appropriate responses based on their existing knowledge and personal perceptions. No prior educational session was conducted before the survey to avoid influencing their responses, thus maintaining the authenticity of the baseline knowledge level. The data collected through the completed questionnaires were coded and entered into the Statistical Package for the Social Sciences (SPSS) software, version 22, for statistical analysis. Descriptive statistics were applied to evaluate the distribution of responses, and results were expressed in terms of frequencies and percentages to facilitate clear interpretation.

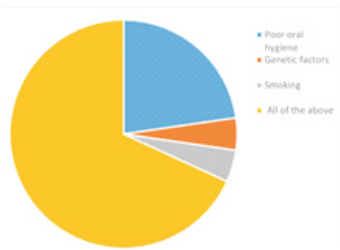
Result:

A total of 162 nursing students participated in the survey, with a predominance of females (77.2%) and the majority falling within the 18–20 years age group (52.5%), followed by 30.9% aged 20–25 years, 12.3% aged 25–30 years, and 4.3% above 30 years. In terms of clinical experience, 37% had less than one year of experience, 30.9% had 2–3 years, and 32.1% had more than 3 years (Table 1). The mean age of participants was 32.1 years (SD = 8.5), with a mean awareness score of 68.5 out of 100 (SD = 12.3) (Table 2).

A large majority (approximately 85%) demonstrated a positive response regarding the association between oral and systemic health, while 15% showed a negative perception (Fig,1). When asked about contributing factors to systemic disease, around 70% identified “all of the above” (poor oral hygiene, smoking, and genetic factors), reflecting comprehensive awareness (Fig,2). Cardiovascular diseases were most commonly linked with oral health (approximately 70%), followed by diabetes (15%), respiratory infections (10%), and pregnancy outcomes (5%) (Fig,3).



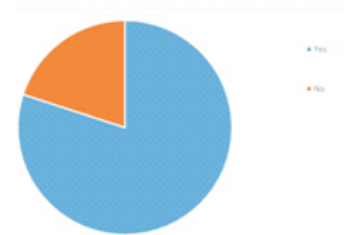
Fig,1; 85% of participants gave positive response for systemic and oral health association.



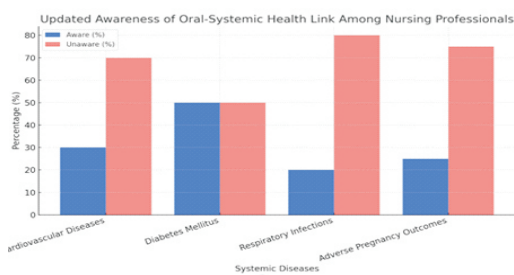
Fig,2; Participants gave the mixed response about contributing factor to systemic disease.



Fig,3; About 70% response was for association of CVD's and oral health.



Fig,4; 97% of reponse for integration of oral health care in general health care practice.



Graph-1; Percentage distribution graph for awareness regarding the relationship between oral health and selected

systemic diseases, 50% recognized diabetes as associated with oral health.

Table -1; Showing Most participants were aged 25–30 years (52.5%), with varied clinical experience predominantly ranging from less than one year (37%) to more than three years (32.1%).

Table 1: Descriptive Statistics

Characteristic	Category	Frequency (N)	Percentage (%)
Gender	Female	125	77.2%
	Male	37	22.8%
Age Distribution	18–20 years	85	52.5%
	20-25 years	50	30.9%
	25-30 years	20	12.3%
	>30 years	7	4.3%
Experience in Nursing	<1 years	60	37.0%
	2-3 years	50	30.9%
	>3 years	52	32.1%

Table-2; Showing mean age of participants was 35.0 years (SD = 5.77), with a mean awareness score of 62.5 out of 100 (SD = 18.76).

Table 2: Descriptive Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation
Age (years)	18	32	32.1	8.5
Years of Experience	1	5	9.2	6.7
Awareness Score (out of 100)	30	95	68.5	12.3

Notably, 97% of respondents agreed that oral health should be integrated into general health care, while only 3% were uncertain or disagreed (Fig,4). Prior exposure to oral-systemic health information was reported by 80% of participants. However, awareness of specific systemic links varied: 50% recognized diabetes as associated with oral health, whereas awareness of cardiovascular disease (30%), respiratory infections (20%), and adverse pregnancy outcomes (25%) remained relatively low(graph 1). These findings highlight moderate overall awareness among nursing students, with strong general attitudes but gaps in specific knowledge, particularly regarding lesser-known oral-systemic connections.

Discussion:

The present study was conducted to evaluate the awareness and perception of nursing students regarding the link between poor oral health and various systemic diseases. With oral-systemic health gaining significant attention in recent

decades, especially in relation to chronic conditions such as diabetes, cardiovascular diseases, and pregnancy-related complications, the involvement of nursing professionals becomes increasingly important in promoting integrated healthcare. This study contributes to the growing body of literature by highlighting the current level of awareness among future nurses and identifying areas where educational reinforcement is necessary.

The demographic profile of the participants revealed that the majority were female (77.2%), consistent with the general gender trends in the nursing profession. Most participants were in the younger age group (18–20 years, 52.5%) and had limited clinical exposure, with 37% having less than one year of experience. This relatively early stage of professional training may have influenced the overall knowledge levels observed. Despite the mean age being 32.1 years, the wide standard deviation (SD = 8.5) indicates a diverse participant base in terms of age and possibly academic level.

The mean awareness score of 68.5 out of 100, with a standard deviation of 12.3, reflects a moderate level of knowledge among the nursing students. This aligns with findings from similar studies that report average to below-average awareness of the oral-systemic connection among non-dental healthcare professionals (Petersen & Ogawa, 2012). Encouragingly, 85% of the respondents demonstrated a positive perception of the oral-systemic health link, indicating an openness to interdisciplinary healthcare concepts, even if detailed knowledge was lacking.

When exploring specific areas of awareness, most respondents (70%) correctly identified “all of the above” when asked about risk factors for systemic diseases, which included poor oral hygiene, smoking, and genetic predisposition. This suggests a foundational understanding of the multifactorial nature of systemic health, particularly concerning lifestyle and behavioral contributors. However, deeper analysis revealed significant variation in the recognition of individual systemic diseases associated with poor oral health.

Cardiovascular diseases (CVDs) were the most commonly associated condition (identified by approximately 70% of participants), which may be attributed to the wider availability of public health campaigns and clinical discussions emphasizing the relationship between periodontal disease and atherosclerosis or endocarditis. Awareness of diabetes mellitus was moderate, with 15% identifying it explicitly, even though this is one of the most widely established bidirectional relationships in medical literature. Alarming, awareness was substantially lower for respiratory infections (~10%) and pregnancy-related complications (~5%). These findings are concerning given the established evidence linking periodontitis with increased

risks of aspiration pneumonia in elderly or hospitalized patients, and adverse pregnancy outcomes such as preterm birth, low birth weight, and preeclampsia (Offenbacher et al., 1996; Scannapieco & Mylotte, 1996).

This discrepancy highlights a major knowledge gap in the training of nursing professionals, especially concerning lesser-discussed but clinically relevant oral-systemic links. Nursing professionals are often at the frontline of healthcare, providing both preventive and therapeutic support. Lack of awareness about such associations could result in missed opportunities for early intervention and patient education. Furthermore, the bar graph depicting awareness levels confirmed these gaps, showing that while 50% were aware of the diabetes link, only 20–30% were aware of associations with other systemic conditions like respiratory infections and adverse pregnancy outcomes.

Another encouraging finding was that 97% of participants agreed with the idea of integrating oral health into general healthcare protocols. This strong positive attitude indicates that students are receptive to interdisciplinary learning and would likely benefit from curricular reforms that incorporate oral-systemic health topics. Moreover, 80% reported having been exposed to information related to oral-systemic health, although the limited depth of understanding suggests that such exposure may have been superficial or unstructured. This highlights the importance of formal inclusion of oral-systemic topics in nursing syllabi through lectures, interprofessional case studies, and clinical rotations involving dental professionals.

The present study also underscores the role of experience. Although the group was relatively young, about 63% had more than one year of clinical experience. Exposure to patients with complex medical histories might play a role in reinforcing awareness, yet the moderate awareness levels observed even among those with more than 3 years of experience suggest that experiential learning alone may be insufficient without structured educational input.

In light of these findings, there is a clear and urgent need for enhanced interdisciplinary education. Existing nursing curricula may need revision to incorporate comprehensive oral-systemic health training. Workshops, guest lectures by dental professionals, integrated case discussions, and simulation-based learning could be effective strategies to strengthen knowledge and translate it into clinical practice. Additionally, institutional policies should promote collaborative healthcare delivery involving dentists, nurses, and physicians to ensure holistic care.

Conclusion:

This study offers valuable insights into the awareness and perception of nursing students regarding the association between oral health and systemic diseases. The findings reflect a generally positive attitude and a basic understanding of the oral-systemic health relationship among the majority of

participants. High levels of agreement on the need for integrating oral health into general healthcare indicate a promising foundation for interdisciplinary collaboration in the future.

However, the study also reveals critical gaps in specific knowledge, particularly in the recognition of less publicized associations such as those involving respiratory diseases and adverse pregnancy outcomes. While awareness of cardiovascular and diabetic links was relatively higher, the overall mean awareness score suggests only a moderate level of understanding. These gaps may be attributed to the predominantly young age of participants, limited clinical exposure, and insufficient emphasis on oral-systemic links in current nursing curricula.

The study's cross-sectional design, reliance on self-reported data, and the limited scope to a single professional group restrict generalizability. Nonetheless, the results underscore the urgent need to reinforce oral-systemic health education in nursing programs through structured, evidence-based modules.

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