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**Original Research Article**

# A comparative study of nurses' knowledge and attitude towards impact of oral cancer on oral hygiene and nutritional status of patients with oral cancer in selected general and cancer hospital at Mysore and Bangalore with a view to develop self-instructional module

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## ABSTRACT

**Background:** Cancer is burden for almost all societies in the world. It is estimated that approximately 20 million persons are suffering with cancer and every year 10 million die due to cancer.
**Methods:** A descriptive and comparative survey from January 2024 to June 2024 with a quantitative research approach was used. The non-probability convenient sampling technique was used, and 60 nurses (30 each from Cancer Hospital; and General Hospital) had given consent for participation in the study. The tools used for data collection were personal profile, structured knowledge questionnaire, modified Likert-type attitude scale, and opinionnaire for utility of SIM.
**Results:** The study found that 83.35% of General Hospital and Cancer Hospital nurses had strong knowledge, while 10% and 6.66% had low knowledge. All nurses from both institutions have mildly positive to extremely positive thoughts about how oral cancer affects oral hygiene and nutrition. Mean knowledge scores of nurses from General and Cancer hospitals were 14.73 and 16.33, and mean attitude scores were 149.80 and 150.20. Cancer hospital nurses' expertise and attitude correlated significantly. The results show that 86.67% of nurses believe SIM is a valuable source of information and content to assist them better manage oral cancer patients' oral hygiene and nutrition.
**Conclusions:** The study found that cancer hospital nurses had a higher mean knowledge score than general hospital nurses. Thus, knowledge and attitude are linked, and nurses with higher knowledge have a more positive attitude.

**Keywords:** Attitude, Cancer and general hospital, Knowledge, Nurses, Oral cancer

## INTRODUCTION

Oral cancer, a significant global health concern, encompasses malignancies affecting the lips, oral cavity, and oropharynx. It is the thirteenth most common cancer worldwide. Poor oral hygiene and nutritional status further complicate the disease course in oral cancer patients. The World Health Organization emphasizes that oral health is essential for eating, speaking, and social well-being, and that oral diseases significantly impair quality of life.[1] This view is echoed by the FDI World Dental Federation, which defines oral health as the ability

to function confidently without pain or disease.[2] Malnutrition, a frequent complication among head and neck cancer patients, results from reduced oral intake due to mucositis, pain, dysphagia, and xerostomia side effects commonly associated with cancer treatments. These conditions further necessitate rigorous oral care and nutritional support, areas in which nurses play a critical role.[3] However, studies have shown that many nurses lack adequate training in oral cancer-related care.[4] In 2022, oral cancer accounted for approximately 389,485 new cases and 188,230 deaths globally.[5] India alone contributes nearly 35% of these cases, making it one of the countries with the highest burden.[6,7] Despite multiple national efforts, including the National Cancer Registry Programme and initiatives under the National Health Mission, the incidence of oral cancer in India continues to rise. A recent report projects that the incidence of oral and pharyngeal cancers in India is 13.6 per 100,000 population.[8]

The major risk factors for oral cancer include tobacco use (both smoking and smokeless forms), areca nut consumption, alcohol intake, poor oral hygiene, and nutritional deficiencies. Betel quid and commercial preparations like gutkha and pan masala often mixed with tobacco are commonly used in India and significantly increase the risk of oral malignancies. According to the findings of Rumgay et al it is estimated that, globally, approximately 120,200 cases of oral cancer diagnosed in 2022 representing 30.8% (95% uncertainty interval (UI): 29.6–31.9) of the total 389,800 cases were attributable to the use of smokeless tobacco or areca nut. This highlights the substantial etiological contribution of these risk factors to the global burden of oral cancer.[9] The growing burden is closely linked to modifiable factors such as tobacco use, alcohol consumption, and socioeconomic conditions.[10]

Early diagnosis and management of oral cancer not only improve survival outcomes but also mitigate deterioration in oral hygiene and nutritional status. In this context, understanding the knowledge and attitude of nurses who are frontline caregivers is essential. Their awareness and clinical practices directly influence the quality of care provided to patients with oral cancer.[11,12]

### *Need of the study*

Oral care is often neglected in routine nursing except in critical care settings, even though it plays a key role in detecting early signs of disease and treatment side effects. Nurses' knowledge and practices are crucial for maintaining oral hygiene, which improves patient comfort and quality of life. Lack of training and resources results in poor oral care, making it essential for nurses to stay updated with evidence-based practices to manage these patients effectively.[12,13] The incidence of oral cancer is disproportionately higher in developing countries, largely due to variations in lifestyle practices, dietary patterns, and the impact of rapid urbanization.[14,15] In India, although the overall cancer incidence remains lower than in many Western nations, a rising trend in oral cancer cases has been reported, attributed to increased tobacco and areca nut consumption, changing lifestyles, and improved life expectancy.[15,16] Malnutrition is a prevalent and critical concern among patients with head and neck cancers, particularly oral cancer, with studies reporting a prevalence of 50–70% in this population.[16,17]

Cancer-related anorexia is often intensified by radiotherapy-induced complications such as oral mucositis, odynophagia, xerostomia, and taste alterations, all of which significantly impair oral intake and nutritional status.[17,18] Consequently, comprehensive nutritional assessment and individualized support are essential throughout the continuum of cancer care before, during, and after treatment to improve treatment tolerance, outcomes, and overall quality of life.[18,19] Malnutrition is a major concern among head and neck cancer patients, largely due to anorexia, which is worsened by radiotherapy side effects such as radio mucositis, odynophagia, xerostomia, and taste changes. These complications necessitate specialized nutritional support before, during, and after cancer treatment.[3]

## METHODS

### *Study design and setting*

A cross-sectional analytical study was conducted to assess the knowledge, attitude, and perceived utility of a Self-Instructional Module (SIM) on oral care among nurses. The study was carried out in selected tertiary care hospitals located in Bangalore and Mysore, Karnataka, India. These hospitals were chosen based on their high patient load, diversity in clinical settings (cancer-specialized vs. general hospitals), and willingness to participate in the research.

### *Sample size and duration of study*

The study was conducted from January 2024 to June 2024 among 60 registered nurses using non-probability sampling techniques. The sample consisted of 30 nurses from oncology departments and 30 from general medical-surgical wards, ensuring balanced representation from both specialized and non-specialized units.

### *Inclusion criteria*

Nurses with at least six months of clinical experience, willingness to participate and provide informed consent, available during the data collection period were included as study participants.

### *Exclusion criteria*

Nurses currently undergoing training or on leave, those previously exposed to structured training modules on oral care were excluded from this study.

### *Tool development and validation*

The study instruments included personal profile sheet, to collect socio-demographic and professional details, structured knowledge questionnaire which was developed to assess baseline knowledge of oral care practices and complications in oncology settings, modified Likert-type attitude scale, to measure participants' attitudes toward the importance and implementation of oral care in clinical practice, opinionnaire on utility of sim, to gather participant feedback regarding the relevance, clarity, and usability of the Self-Instructional Module.

The tool development followed a systematic process. A blueprint was prepared based on identified domains and objectives. Items were constructed to align with the content areas covered by the SIM. The content validity of the tools was established through expert evaluation by professionals in nursing education, oncology, and clinical research. Reliability testing was performed during the pilot study, and all tools were found to be both valid and reliable.

### *Data collection procedure*

Data was collected in a controlled environment to maintain consistency. Participants were assembled in a designated examination hall within each hospital. After briefing them on the study and obtaining written consent, the SIM was distributed to each nurse along with the data collection tools. Participants were given adequate time to read the module and respond to the questionnaire and opinionnaire independently, without any external guidance or group discussion.

### *Data analysis*

Data was entered into Microsoft Excel Office 365. The data was subsequently imported into IBM Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. to carry out the data analysis. Descriptive statistics were used to summarize the demographic data, knowledge scores, attitudes, and opinions. Inferential statistics were applied to examine associations between variables and compare responses between nurses from cancer and general hospitals.

### *Ethical considerations*

Prior to the commencement of the study, formal written permission was obtained from the administrative authorities of each participating hospital. The study protocol was reviewed and approved by the Institutional Ethics Committee. Informed written consent was obtained from all participants after explaining the objectives, procedures, voluntary nature of participation, and confidentiality measures. Participants were assured that they could withdraw at any point without any consequences.

## RESULTS

Findings in the present study showed that majority of General and of Cancer hospital nurses were in the age group of 20-30 years (83.33% and 93.33% respectively). With regard to education 83.33% of General and 66.67 % of Cancer hospital nurses had passed 10+2.

Majority (96.7%) of nurses from both groups had diploma in General nursing and midwifery (Basic Training). The distribution of subjects by professional experience revealed that 36.67% of nurses from General and 56.67% of nurses from Cancer hospital had only one-year of experience. The data revealed that 66.67% of General and 26.67 % of Cancer hospital nurses did not attend any related in-service education program. 66.7% of General and 33.33% of Cancer hospital nurses did not have any experience of caring for patients with oral cancer. These findings are tabulated in Table 1.

Majority (83.33%) of nurses from general hospitals and cancer hospitals demonstrated a good level of knowledge, suggesting that most nurses, irrespective of hospital type, had good level of knowledge regarding oral care. However, only a small proportion achieved a very good score, indicating the potential need for continued education and training interventions in both general and cancer-specific clinical settings.

Among general hospital nurses (n=30), the majority (83.33%) demonstrated a good level of knowledge (score range 11–20), while 10% exhibited poor knowledge (0–10), and only 06.66% attained a very good level (21–30). Similarly, among cancer hospital nurses (n=30), 83.33% also fell into the good knowledge category, with 06.66% in the poor category and a slightly higher 10% showing a very good level of knowledge. This distribution indicates a comparable knowledge pattern in both groups, with a predominant concentration in the 'good' category and a marginally better performance in the 'very good' category among cancer hospital nurses. These findings are presented in Table 2.

The mean knowledge score of nurses from the cancer hospital group was slightly higher (M=16.33, SD=5.76) compared to those from general hospitals. These results suggest that nurses in cancer hospitals may have relatively better knowledge of oral care, possibly due to greater exposure to patients with oral and head-neck cancer and related care protocols. These findings are presented in Table 3.

Mean attitude scores of nurses from general and cancer hospitals were 149.80 and 154.20 respectively. It is evident from results that majority (93.33%) of nurses from general hospital and 66.66% nurses from Cancer hospital had slightly positive attitude. It was also observed that the mean difference of attitude scores towards impact of oral cancer on oral hygiene and nutritional status of patients with oral cancer among

nurses from general and cancer hospitals is 4.4 which is not statistically significant (p>0.05). With regard to attitude, all nurses from both hospitals have slightly positive to strongly positive attitudes towards the impact of oral cancer on oral hygiene and nutritional status of patients with oral cancer.

However, there was no statistically significant difference between knowledge and attitude scores of nurses from General and Cancer hospitals 't' (58) =1.67, p>0.05 and 't'(58) =1.212, p>0.05 respectively. These findings are depicted in Table 4. Among nurses from general hospitals, the correlation between knowledge (M=14.73) and attitude (M=149.80) was positive but not statistically significant (r=0.262, p>0.05).

In contrast, a moderate positive and statistically significant correlation was observed among nurses from cancer hospitals between knowledge (M=16.33) and attitude (M=15.42), with a correlation coefficient of r=0.448, (p<0.05). This suggests that, in cancer hospital settings, higher knowledge levels were associated with more favorable attitudes toward oral care. These findings are tabulated in Table 5.

**Table 1: Distribution of selected personal variables of general and cancer hospital.**

| Selected personal variables | General Hospital Nurses (n=30) N (%) | Cancer Hospital Nurses (n=30) N (%) |
|---|---|---|
| **Age (in years)** | | |
| 20-30 | 25 (83.33) | 28 (93.33 |
| Above 30 | 05 (16.67) | 02 (06.67) |
| **General education** | | |
| 10+2 | 25 (83.33) | 20 (66.67) |
| Graduate & above | 05 (16.67) | 10 (33.33) |
| **Professional education** | | |
| Diploma in Nursing | 29 (96.67) | 29 (96.67) |
| P. B.Sc. in Nursing | 01 (03.33) | 01 (03.33) |
| **Professional experience (in years)** | | |
| 0-1 | 11 (36.67) | 17 (56.67) |
| 2-3 | 06 (20.00) | 08 (26.67) |
| 4- 5 | 03 (10.00) | 03 (10.00) |
| 5 and above | 10 (33.33) | 02 (06.66) |
| **Number of in-service education programmes attended on oral care** | | |
| None | 20 (66.67) | 08 (26.66) |
| 1-2 | 06 (20.00) | 12 (40.00) |
| 3-4 | 01 (03.33) | 05 (16.67) |
| 5 and above | 03 (10.00) | 05 (16.67) |
| **Experience of caring for patient with oral cancer** | | |
| None | 20 (66.67) | 10 (33.33) |
| 1-2 | 07 (23.33) | 16 (53.34) |
| 3 and above | 03 (10.00) | 04 (13.33) |

**Table 2: Frequency and percentage of knowledge scores of cancers and general hospital nurses.**

| Level of knowledge | General hospital nurses (N=30) F (%) | Cancer hospital nurses (N=30) F (%) |
|---|---|---|
| **Poor (0-10)** | 03 (10.0) | 02 (6.67) |
| **Good (11-20)** | 25 (83.33) | 25 (83.33) |
| **Very good (21-30)** | 02 (6.67) | 03 (10.0) |

**Table 3: Mean, Median and S.D of knowledge scores of cancers and general hospital nurses.**

| Group | Mean | Median | S. D | Range | |
|---|---|---|---|---|---|
| | | | | Min. | Max. |
| **General hospital (n=30)** | 14.73 | 14 | 3.65 | 8 | 22 |
| **Cancer hospital (n=30)** | 16.33 | 16.5 | 5.76 | 8 | 24 |

**Table 4: Attitude scores of nurses from general and cancer hospital.**

| Group | Mean | Median | S. D | Range | |
|---|---|---|---|---|---|
| | | | | Min | Max |
| **Nurses from general hospital n=30** | 149.80 | 148 | 09.69 | 131 | 181 |
| **Nurses from cancer hospital n=30** | 154.20 | 152.5 | 17.37 | 115 | 187 |

Mean difference 4.4, p value>0.05.

**Table 5: Correlation coefficient computed between knowledge and attitude scores regarding impact of oral cancer on oral hygiene and nutritional status of patients with oral cancer of nurses from General and cancer hospital.**

| Variables | Mean value | Coefficient of correlation | Significance level |
|---|---|---|---|
| **Knowledge (General hospital nurses n=30)**<br>**attitude** | 14.73<br>149.80 | 0.262 | Not Significant<br>p>0.05 |
| **Knowledge (Cancer hospital nurses n=30)**<br>**attitude** | 16.33<br>15.42 | 0.448 | Significant<br>P<0.05 |

## DISCUSSION

### *Knowledge of oral care among nurses*

Our study found high knowledge scores among nurses from both general (mean=14.73) and oncology (mean=16.33) hospitals, with 83.33% of participants demonstrating good knowledge. However, no statistically significant difference was observed between the two groups. This contrasts with the study conducted by Pai et al who observed a significant difference in knowledge between general and oncology nurses in India, with oncology nurses having better awareness due to specific training modules (p<0.05).[13] In our setting, the absence of significant difference may suggest the presence of standardized training protocols across institutions, minimizing the disparity in knowledge. The results are in partial agreement with the study conducted by Philip et al who reported 90% of nurses in a tertiary hospital in India possessing good oral health knowledge, especially regarding systemic health implications, though they noted gaps in practical areas such as denture care.[21] Importantly, Yee et al observed in Singapore that paediatric oncology nurses had moderate theoretical knowledge but showed uncertainty about oral care protocols, despite acknowledging its relevance in cancer care.[22] This further supports our finding that knowledge alone may not translate into consistent confidence or practice, and protocol-driven reinforcement remains necessary.

### *Attitude towards oral care*

Nurses generally demonstrated positive attitudes toward oral care, with 93.33% of general nurses and 66.66% of oncology nurses displaying slightly positive attitudes. Interestingly, a greater proportion of oncology nurses (33.33%) exhibited strongly positive attitudes compared to only 6.66% among general nurses. These findings are in agreement with those reported by Philip et al, who observed that most nurses had a favourable attitude toward oral care in cancer patients, though gaps in training remained.[21] Similarly, Yee et al noted that frequent exposure to patients suffering from oral complications in oncology settings enhances nurses' motivation and preparedness to deliver effective oral hygiene care, underscoring the importance of clinical experience in shaping positive attitudes.[22] Interestingly, while the results showed oncology nurses had more strongly positive attitudes, their overall positivity rate was lower than general nurses. This might reflect greater awareness of oral care challenges among oncology nurses, leading to more cautious self-assessment of attitudes.

### *Correlation between knowledge and attitude*

A significant positive correlation between knowledge and attitude was observed exclusively among oncology nurses. This finding is consistent with the work of Pai et al who reported a moderate correlation (r=0.42, p<0.05) between these variables in paediatric oncology settings, which they attributed to the implementation of structured oral care training programs.[23] Similarly, Yee et al emphasized that the presence of institutional protocols and interdisciplinary reinforcement plays a crucial role in narrowing the knowledge-attitude-practice gap among paediatric oncology nurses.[22] In contrast, the study found no significant correlation between knowledge and attitude among general hospital nurses. These findings align with the findings of Philip et al, who observed weak or non-significant associations in general settings, possibly due to lack of targeted oral care training.[21]

## CONCLUSION

The findings underscore the fact that specialized oncology training enhances both knowledge and attitude towards oral care. Despite high knowledge across both groups, only oncology nurses demonstrated a knowledge–attitude correlation, indicating the importance of contextual learning and practical reinforcement.

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