RESEARCH PAPER

Knowledge, Attitude, and Practices Regarding Head and Neck Cancer Among Nursing Staff and Their Association with Sociodemographic Characteristics: A Survey Based Study

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Received: 7th August 2026

Revised: 5th September 2026

Accepted: 10th November 2026

Available Online: 15th November 2026

Abstract

Objective: The aim of this study was to assess the knowledge, practice, and attitude regarding head and neck cancer (HNC) among nursing staff and to determine their association with selected sociodemographic characteristics.

Materials and Methods: A cross-sectional study was conducted among 400 nursing staff using a structured self-administered questionnaire. The questionnaire included sections on sociodemographic and professional characteristics, knowledge regarding HNC, attitudes toward HNC prevention and care, and HNC-related nursing practices. Data were analysed using descriptive and inferential statistics with IBM SPSS Statistics v 31.0

Results: Overall, 75.8% of participants demonstrated adequate knowledge, 73.3% had a positive attitude, whereas only 47.5% demonstrated good practice regarding HNC care. Knowledge was highest regarding the role of combined tobacco and alcohol use as a risk factor (94.5%) and the importance of dysphagia assessment (92.5%). Positive attitudes were observed particularly toward psychological counselling (87.8%) and oncology-related training (88.6%). Previous HNC-related training was significantly associated with better practice (61.2% vs. 39.5%, $p < 0.001$), but was not significantly associated with knowledge or attitude. Age was significantly associated with knowledge ($p = 0.042$), while gender was associated with practice ($p = 0.027$).

Conclusions: The findings demonstrate a knowledge–practice gap among nursing staff despite generally adequate knowledge and positive attitudes. The significant association between previous HNC training and better practice highlights the need to strengthen structured, competency-based HNC education and continuing professional development to improve evidence-based nursing care.

Keywords: attitude, head and neck cancer, knowledge, oncology nursing, practice

How to cite this article: Prajwal Anil Gupta1 Sima Chauhan2* Sourav Debnath3 Anupama Sharma4 Yogesh Kumar Singh5. Knowledge, Attitude, and Practices Regarding Head and Neck Cancer Among Nursing Staff and Their Association with Sociodemographic Characteristics: A Survey Based Study. Int J Drug Deliv Technol. 2026;16(90s):1996-2007. DOI: 10.25258/ijddt.16.90s.200.

1.0 Introduction

Head and neck cancer (HNC) represents a major global health problem and encompasses malignancies arising from the oral cavity, pharynx, larynx, nasopharynx, salivary glands, and other anatomical sites of the head and neck [1]. These cancers cause substantial morbidity and mortality by affecting swallowing, speech, breathing, nutrition, and appearance [2]. The burden is particularly important in South Asia, including India, where tobacco use is a major preventable risk factor [3]. According to GLOBOCAN 2024, lip and oral cavity cancer was among the three most commonly diagnosed cancers in India, with approximately 205,878 new cases reported among both sexes [4].

The development of HNC is multifactorial, with smoked and smokeless tobacco, alcohol, and HPV infection being important risk factors [5–8]. Combined tobacco and alcohol exposure substantially increases HNC risk [7]. Despite advances in diagnosis and treatment, delayed diagnosis remains an important challenge [9]. Early recognition of warning signs, patient education, tobacco-cessation counselling, and timely referral can contribute to prevention and improved outcomes [10,11].

Nurses frequently have prolonged and direct contact with patients and therefore play an important role in identifying warning signs, educating patients, promoting tobacco cessation, supporting treatment, and facilitating appropriate referral [12–17]. However, there is limited institution-specific evidence regarding nursing staff's knowledge of HNC risk factors and warning signs, attitudes toward prevention and early detection, and patient-care practices related to counselling and referral, particularly in tertiary-care settings.

The present study addresses this gap by assessing the knowledge, attitudes, and practices (KAP) of nursing staff regarding head and neck cancer (HNC) at a tertiary care centre in Rajasthan. Particular emphasis was placed on patient-care practices, including recognition of warning signs, patient education, tobacco-cessation counselling, and appropriate referral. The study also explored the association of KAP levels with sociodemographic characteristics, including prior HNC-related training. The findings aim to identify existing gaps and inform targeted nursing education, continuing professional development, patient counselling, and strategies for early detection and prevention of HNC.

2.0 Materials and Methods

2.1 Study Design and Setting

This cross-sectional, questionnaire-based observational study was conducted at a tertiary care centre in Rajasthan, India. The study was carried out among nursing staff working in clinical departments involving direct patient care, including Medicine, Surgery, ENT, Oncology, Intensive Care Unit (ICU), Emergency, and Outpatient Department (OPD). The study population comprised nursing staff working at the selected tertiary care centre.

Data were collected using both online and offline survey methods to facilitate broad participation and include nursing personnel from different clinical departments. The online survey was administered through Google Forms and disseminated through digital platforms, including WhatsApp, Facebook, Instagram, and email. Participants were also encouraged to share the survey link within their professional and social networks, facilitating wider participation through a snowball approach.

Eligible participants included registered nursing personnel who were currently working at the study centre and were directly involved in patient care. Nurses with different educational qualifications, including GNM, B.Sc. Nursing, Post Basic B.Sc. Nursing, and M.Sc. Nursing, and different designations, including Staff Nurses, Nursing Officers, Sister In-charges, and Nursing Tutors, were eligible for participation. Nurses who were on prolonged leave during the study period or who were unwilling to participate were excluded.

Participants were recruited using a non-probability sampling technique, primarily convenience sampling, based on the availability of eligible nursing staff during the study period. Participation was voluntary, and written informed consent was obtained from each participant before administration of the questionnaire. Confidentiality and anonymity were maintained throughout the study.

Study Participants & Data Collection

2.2 Procedure

After obtaining approval from the Institutional Ethics Committee and permission from the administration of the selected tertiary care centre, eligible nursing staff were approached and informed about the purpose, objectives, and procedures of the study. Participants were assured that participation was voluntary and that refusal to participate or withdrawal from the study would not affect their professional status or employment.

After obtaining written informed consent, the self-administered structured questionnaire was distributed to the participants. The questionnaire required approximately 10–15 minutes to complete. Participants were instructed to complete the questionnaire independently without discussing their responses with colleagues in order to minimize information bias.

The questionnaire consisted of four sections. Section A collected socio-demographic and professional information, including age, gender, educational qualification, designation, department, years of nursing experience, and previous formal training in head and neck cancer. Section B assessed knowledge regarding head and neck cancer, its warning signs, treatment, chemotherapy-related care, and selected aspects of nursing management. Section C assessed attitudes toward early detection, patient education, prevention, supportive care, and the role of nurses in head and neck cancer management. Section D assessed self-reported nursing practices related to identification of suspicious lesions, patient education, oral hygiene, swallowing assessment, treatment-related complications, follow-up, multidisciplinary care, laboratory assessment, and medication adherence.

Completed questionnaires were checked for completeness at the time of collection. No personal identifiers were recorded. The collected data were coded, entered, and subsequently analyzed using IBM SPSS Statistics.

2.3 Questionnaire Development and Validation

A structured questionnaire was developed specifically for the present study to assess the knowledge, attitude, and practices (KAP) of nursing staff regarding head and neck cancer and its risk factors, with particular emphasis on nursing responsibilities and patient care. The questionnaire was developed based on a review of relevant scientific literature, established information regarding head and neck cancer risk factors and warning signs, principles of cancer prevention and early detection, and standard nursing care for oncology patients.

The questionnaire comprised four sections. Section A contained seven items related to the demographic and professional characteristics of the participants. Section B consisted of 10 knowledge items covering the definition and anatomical sites of head and neck cancer, risk factors, warning signs, multidisciplinary treatment, dysphagia and aspiration risk, commonly used chemotherapeutic agents, pre-chemotherapy assessment, and neutropenia-related infection risk. Section C contained 11 attitude statements measured using a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." Section D contained 12 practice-related items assessing self-reported nursing practices using Yes/No responses and five-point frequency categories ranging from "Always" to "Never."

2.4 Content Validity

The initial questionnaire was developed following a review of relevant literature concerning head and neck cancer, its risk factors, early warning signs, treatment modalities, and nursing care. Content validity was established through expert review by three subject experts from the Departments of General Surgery, ENT, and Medical Oncology.

The experts independently reviewed the questionnaire items for relevance, clarity, appropriateness, comprehensibility, and adequacy of coverage in relation to the study objectives. Particular attention was given to the clinical accuracy of the items, their applicability to nursing practice, and the comprehensive assessment of the knowledge, attitude, and practice domains.

Based on the recommendations of the experts, necessary modifications were made to the wording, sequence, and content of the questionnaire. Ambiguous, repetitive, or inappropriate items were revised or removed. The final version of the questionnaire was prepared after incorporating the suggestions provided by the experts.

2.5 Reliability of the Questionnaire

2.5.1 Pilot Testing and Reliability Assessment

Pilot testing and reliability assessment of the developed questionnaire were conducted among 33 nursing participants who were comparable to the target study population but were not included in the main study sample. The purpose of the pilot testing was to assess the clarity, feasibility, acceptability, and internal consistency of the questionnaire before its use in the main study.

The internal consistency of the attitude and practice sections was assessed using Cronbach's alpha coefficient. The knowledge section, which predominantly consisted of dichotomous and multiple-choice items, was assessed using the Kuder–Richardson 20 (KR-20) coefficient, where applicable. A reliability coefficient of ≥0.70 was considered indicative of acceptable internal consistency.

The pilot assessment demonstrated acceptable internal consistency of the questionnaire, supporting its use as a reliable instrument for assessing knowledge, attitudes, and practices regarding head and neck cancer. Following expert validation and pilot reliability testing, the final questionnaire was administered to the 400 participants included in the main study.

2.6 KAP Scoring and Categorization

The knowledge, attitude, and practice (KAP) domains were scored independently because each domain assessed a distinct component of nursing staff's understanding and clinical behavior regarding head and neck cancer. A standardized scoring system was applied to each section, and the obtained scores were used for descriptive and inferential statistical analysis.

2.6.1 Knowledge Scoring

The knowledge domain consisted of 10 items (K1–K10) covering the definition and common sites of head and neck cancer, warning signs, multidisciplinary treatment, dysphagia and aspiration, chemotherapy, pre-chemotherapy assessment, and treatment-related complications. Each item had a single correct response. A score of 1 was assigned for a correct answer, whereas 0 was assigned for an incorrect answer or a "Don't know" response. Thus, the total possible knowledge score ranged from 0 to 10, with higher scores indicating better knowledge.

Based on the percentage score, knowledge was categorized into three levels: inadequate knowledge (<50%), moderately adequate knowledge (50–74%), and adequate knowledge (≥75%). For analyses involving a binary outcome, participants scoring ≥75% were classified as having adequate knowledge, whereas those scoring <75% were classified as having inadequate knowledge.

2.6.2 Attitude Scoring

The attitude domain consisted of 11 statements (A1–A11) assessing participants' perceptions regarding the role of nurses in early detection, tobacco cessation education, oral examination, referral of suspicious lesions, nutritional counselling, community awareness, pain assessment, management of treatment-related complications, patient education, psychological support, and oncology-related training.

Each statement was assessed using a five-point Likert scale: strongly disagree, disagree, neutral, agree, and strongly agree. Scores of 1, 2, 3, 4, and 5, respectively, were assigned to these responses. The total possible attitude score therefore ranged from 11 to 55. Higher scores indicated a more positive attitude toward head and neck cancer prevention, early detection, treatment, and nursing care. Participants achieving ≥75% of the maximum possible score were considered to have a positive attitude, while those scoring <75% were categorized as having a less positive attitude.

2.6.3 Practice Scoring

The practice domain consisted of 12 items (P1–P12) assessing self-reported nursing practices related to head and neck cancer patient care. These included identification of suspicious oral lesions, participation in awareness activities and continuing nursing education, documentation of suspicious findings, updating knowledge and guidelines, patient education regarding oral hygiene and treatment-related complications, swallowing assessment, follow-up after discharge, multidisciplinary collaboration, review of laboratory investigations before chemotherapy, and medication-adherence counselling. Items P1–P3 were assessed using Yes/No responses, with 1 point assigned for "Yes" and 0 points for "No." Items P4–P12 were assessed using a five-point frequency scale: Never = 0, Rarely = 1, Sometimes = 2, Often = 3, and Always = 4. Because the practice section contained items with different scoring ranges, the raw scores were standardized to a percentage of the maximum possible score before categorization.

Participants achieving a practice score of ≥75% were classified as demonstrating good practice, whereas those scoring <75% were classified as demonstrating poor/moderate practice. Higher practice scores indicated more frequent implementation of recommended nursing practices related to head and neck cancer care.

2.7 Statistical analysis:

Data were entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) version 31.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized using frequencies and percentages, while continuous variables were presented as mean ± standard deviation (SD). The internal consistency of the 33-item KAP questionnaire was assessed using Cronbach's alpha, with corrected item–total correlations examined at the item level.

KAP responses were scored according to the predefined scoring system and categorized into adequate/inadequate knowledge, positive/negative attitude, and good/poor practice. Associations between KAP categories and categorical sociodemographic and professional characteristics were assessed using the Pearson chi-square test. Where expected cell counts were small, Fisher's exact test or the Fisher–Freeman–Halton exact test was used where required because of sparse cell counts. Age, a continuous variable, was compared between KAP categories using the independent-samples t-test. Statistical significance was set at a two-sided p-value <0.05.

3.0 RESULTS

3.1 Sociodemographic Characteristics of the Study Participants

Among the 400-nursing staff included in the study, the mean age was 26.53 ± 5.21 years. The majority were female (64.0%) and had a GNM qualification (64.3%). Most participants were Staff Nurses (82.3%), with the largest proportion working in the ICU (35.5%). Regarding professional experience, 44.8% had less than 1 year of experience, followed by 39.0% with 1–5 years. Only 36.8% had received formal training regarding head and neck cancer, whereas 63.2% had not received such training. Overall, the study population consisted predominantly of young nursing staff, with limited professional experience and a substantial gap in formal head and neck cancer-related training (**Table 1**).

Table 1. Sociodemographic Characteristics of Study Participants (N=400)

Characteristic	Category	n	%
Age (years)	Mean ± SD	26.53 ± 5.21	
Gender	Female	256	64.0
	Male	144	36.0
Educational qualification	GNM	257	64.3
	B.Sc. Nursing	113	28.2
	Post Basic B.Sc. Nursing	23	5.8
	M.Sc. Nursing	7	1.7

Current designation	Staff Nurse	329	82.3
	Nursing Officer	40	10.0
	Sister In-charge	25	6.3
	Other	6	1.5
Department	ICU	142	35.5
	Medicine	67	16.8
	Surgery	47	11.8
	Oncology	28	7.0
	Emergency	16	4.0
	OPD	15	3.8
	ENT	4	1.0
	Others	81	20.3
Years of nursing experience	<1 year	179	44.8
	1–5 years	156	39.0
	6–10 years	38	9.5
	>10 years	27	6.8
Formal training regarding head and neck cancer	Yes	147	36.8
	No	253	63.2
Age is presented as mean ± standard deviation; categorical variables are presented as frequency and percentage. There were no missing observations.			

3.2 Knowledge, Attitudes, and Practices Regarding Head and Neck Cancer

Among 400 nursing staff, knowledge regarding head and neck cancer was generally high. Most participants correctly identified combined tobacco and alcohol use as a risk factor (94.5%), dysphagia as an aspiration risk (92.5%), neutropenia as an infection risk (91.8%), and unexplained weight loss as a warning symptom (90.5%). Knowledge was comparatively lower regarding multidisciplinary management (70.0%) and commonly used chemotherapy drugs (67.0%) (**Figure 1**).

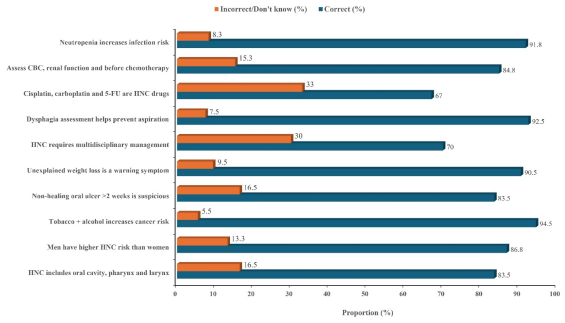

Figure 1. Distribution of Knowledge Regarding Head and Neck Cancer Among Nursing Staff

Attitudes were predominantly positive, with 82.5%–88.5% of participants agreeing or strongly agreeing across the attitude items. The highest positive responses concerned oncology-related training (88.5%), community awareness activities (88.0%), treatment-related patient education (88.0%), and nutritional counselling (87.3%) (**Figure 2**).

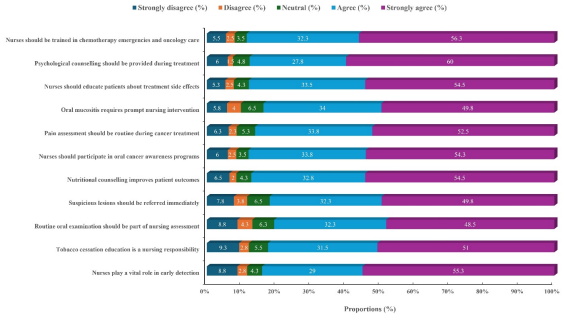

Figure 2. Distribution of Attitudes Toward Head and Neck Cancer Prevention and Care Among Nursing Staff

Practice levels were generally favorable. Most participants reported always educating patients about oral hygiene (83.3%), medication adherence (83.0%), and post-discharge follow-up (82.8%). However, only 56.0% had attended head and neck cancer-related CNE/CME during the previous two years, and documentation of suspicious oral findings (62.5%) and updating cancer-related guidelines (62.0%) were comparatively less frequent (**Figure 3**).

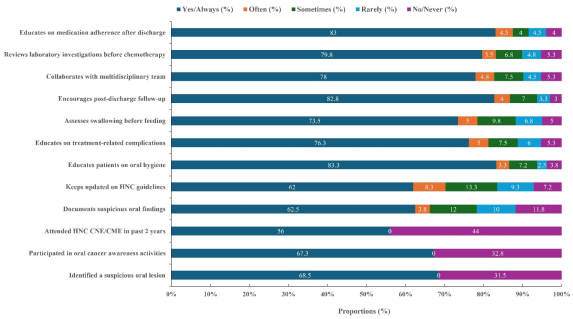

Figure 3. Distribution of Practices Regarding Head and Neck Cancer Care Among Nursing Staff

3.3 Association of KAP Levels with Sociodemographic and Professional Characteristics

As shown in **Table 2**, adequate knowledge was observed in 75.8% of participants, while 73.3% had a positive attitude and 47.5% demonstrated good practice. Age was significantly associated with knowledge, with participants having adequate knowledge being slightly older than those with inadequate knowledge (26.83 ± 5.35 vs. 25.59 ± 4.67 years; $p = 0.042$).

Table 2. Association of KAP Levels with Sociodemographic and Professional Characteristics

Variable	Category / comparison	Knowledge, n (%)	p-value	Attitude, n (%)	p-value	Practice, n (%)	p-value
Age, years	Adequate/Positive/Good	26.83 ± 5.35	0.042	26.80 ± 5.49	0.053†	26.79 ± 5.32	0.335
	Inadequate/Negative/Poor	25.59 ± 4.67		25.78 ± 4.31		26.29 ± 5.12	
Gender	Male	114 (79.2%)	0.232	108 (75.0%)	0.553	79 (54.9%)	0.027
	Female	189 (73.8%)		185 (72.3%)		111 (43.4%)	
Education	GNM	193 (75.1%)	0.959‡	181 (70.4%)	0.329‡	121 (47.1%)	0.148‡
	B.Sc. Nursing	87 (77.0%)		87 (77.0%)		50 (44.2%)	
	Post Basic B.Sc. Nursing	18 (78.3%)		19 (82.6%)		13 (56.5%)	
	M.Sc. Nursing	5 (71.4%)		6 (85.7%)		6 (85.7%)	
Designation	Staff Nurse	241 (73.3%)	0.089‡	234 (71.1%)	0.251‡	149 (45.3%)	0.204‡
	Nursing Officer	34 (85.0%)		33 (82.5%)		25 (62.5%)	
	Sister-in-charge	22 (88.0%)		21 (84.0%)		13 (52.0%)	
	Others	6 (100.0%)		5 (83.3%)		3 (50.0%)	
Department	ICU	109 (76.8%)	0.306‡	108 (76.1%)	0.185‡	67 (47.2%)	0.229‡
	Medicine	46 (68.7%)		44 (65.7%)		32 (47.8%)	
	Surgery	36 (76.6%)		31 (66.0%)		19 (40.4%)	

	Oncology	23 (82.1%)		21 (75.0%)		20 (71.4%)	
	Emergency	13 (81.3%)		13 (81.3%)		9 (56.3%)	
	OPD	13 (86.7%)		11 (73.3%)		6 (40.0%)	
	ENT	1 (25.0%)		1 (25.0%)		1 (25.0%)	
	Others	62 (76.5%)		64 (79.0%)		36 (44.4%)	
Nursing experience	**<1 year**	125 (69.8%)	0.099‡	121 (67.6%)	0.146‡	76 (42.5%)	0.111‡
	1–5 years	124 (79.5%)		120 (76.9%)		78 (50.0%)	
	6–10 years	31 (81.6%)		31 (81.6%)		24 (63.2%)	
	>10 years	23 (85.2%)		21 (77.8%)		12 (44.4%)	
Previous HNC training	**No**	191 (75.5%)	0.90	185 (73.1%)	1.00	100 (39.5%)	<0.001‡
	Yes	112 (76.2%)		108 (73.5%)		90 (61.2%)	

Values are n (%) within each category, except age, which is presented as mean ± SD. P-values are based on Pearson's chi-square test unless otherwise indicated. †For age and attitude, the unequal-variance t-test (Welch's t-test) was used because Levene's test was significant. ‡Exact p-values from Fisher–Freeman–Halton or Fisher's exact test were used where expected cell counts were small. For 2 × 2 comparisons, Fisher's exact test was used. HNC = head and neck cancer.

Among categorical characteristics, gender was significantly associated with practice ($p = 0.027$), with good practice more frequently observed among male nurses than female nurses (54.9% vs. 43.4%). In contrast, gender was not significantly associated with knowledge ($p = 0.232$) or attitude ($p = 0.553$).

However, previous HNC training was significantly associated with practice ($p < 0.001$), with good practice reported more frequently among nurses who had received previous HNC training than among those without such training (61.2% vs. 39.5%).

3.4 Reliability and Internal Consistency

The 33-item KAP questionnaire demonstrated good overall internal consistency (Cronbach's α = 0.899). Domain-wise, the Knowledge section showed acceptable reliability (α = 0.721), the Attitude section demonstrated excellent reliability (α = 0.961), and the Practice section showed good reliability (α = 0.880). Corrected item-total correlations ranged from 0.298–0.453 for Knowledge, 0.700–0.875 for Attitude, and 0.254–0.736 for Practice, indicating satisfactory item consistency within each domain. Overall, these findings support the reliability of the questionnaire for assessing knowledge, attitude, and practices regarding head and neck cancer among nursing staff (**Supplementary Table 1**). Detailed item-wise reliability statistics are provided in **Supplementary Table 2**

Supplementary Table 1: Reliability and Internal Consistency of the KAP Questionnaire

Domain	**No. of**	**Cronbach's α**	**Standardized α**	**Corrected item-**

	items			total correlation range
Knowledge	10	0.721	0.733	0.298–0.453
Attitude	11	0.961	0.962	0.700–0.875
Practice	12	0.880	0.871	0.254–0.736
Overall KAP questionnaire	33	0.899	0.895	0.091–0.691*

Supplementary Table 2: Internal consistency and item analysis of the 33-item KAP questionnaire (n = 400)

Domain	Item	Corrected item-total correlation	Cronbach's α if item deleted
Knowledge	K1	0.251	0.899
	K2	0.261	0.899
	K3	0.300	0.899
	K4	0.293	0.899
	K5	0.272	0.899
	K6	0.276	0.899
	K7	0.247	0.899
	K8	0.255	0.899
	K9	0.324	0.898
	K10	0.328	0.899
Attitude	A1	0.533	0.894
	A2	0.616	0.893
	A3	0.691	0.891
	A4	0.638	0.892
	A5	0.643	0.892
	A6	0.626	0.893
	A7	0.671	0.892
	A8	0.675	0.892
	A9	0.689	0.891
	A10	0.661	0.892
	A11	0.669	0.892
Practice	P1	0.116	0.900
	P2	0.107	0.900
	P3	0.091	0.900
	P4	0.265	0.902
	P5	0.380	0.898
	P6	0.474	0.896
	P7	0.495	0.895
	P8	0.443	0.896
	P9	0.459	0.896
	P10	0.465	0.896
	P11	0.460	0.896
	P12	0.441	0.896
Overall questionnaire	**33 items**		**Cronbach's α = 0.899**

4.0 Discussion

The present study provides an overall assessment of knowledge, attitudes, and practices (KAP) related to head and neck cancer (HNC) among nursing staff. Among the 400 participants, 75.8% demonstrated adequate knowledge and 73.3% had a positive attitude, whereas only 47.5% demonstrated good practice. This discrepancy between knowledge, attitudes, and practice represents an important finding and suggests that having adequate knowledge and favorable attitudes does not necessarily translate into consistent implementation of recommended HNC-related clinical practices.

The study population was relatively young, with a mean age of 26.53 ± 5.21 years, and 44.8% had less than one year of nursing experience. Furthermore,

only 36.8% reported previous formal HNC-related training. This profile is relevant when interpreting the observed practice gap, as limited clinical experience and relatively low exposure to structured HNC-specific education may affect the translation of knowledge into routine clinical care. Similar patterns have been described in the literature, where nurses have demonstrated generally favorable oral-health knowledge and attitudes but persistent gaps in specialized cancer-related knowledge and clinical practice. Sood et al. (2024) [18], in a study of 300 nurses from a tertiary-care hospital in Faridabad, reported good oral-health knowledge and satisfactory attitudes among approximately 90% of participants, broadly supporting the favorable knowledge and attitude profile observed in the present study.

Knowledge was strongest for several established HNC risk factors and clinically important warning signs. In the present study, 94.5% of nurses recognized combined tobacco and alcohol use as a risk factor, 90.5% identified unexplained weight loss as a warning symptom, and 92.5% recognized the importance of dysphagia assessment in relation to aspiration risk. These findings indicate that participants were generally familiar with clinically relevant features of HNC. However, knowledge was comparatively lower regarding multidisciplinary management (70.0%) and commonly used chemotherapy drugs (67.0%). This variation suggests that general awareness of HNC may be greater than knowledge of specialized oncology management. A 2024 systematic review similarly identified gaps among nurses in knowledge related to oral diagnoses, cancer-treatment protocols, and appropriate oral-care practices [19]. Thus, future educational programmes should extend beyond general cancer awareness and address disease-specific treatment, complications, and multidisciplinary care.

The attitude findings were encouraging, with 73.3% of participants classified as having a positive attitude. More than 80% of participants responded positively to individual attitude items, particularly those concerning oncology-related training, community awareness, patient education, and nutritional counselling. These responses indicate that nurses recognize the importance of their role in HNC prevention, early recognition, treatment support, and patient education. The findings are broadly consistent with those of Sood et al. (2024) [18], who reported favorable attitudes toward oral health among nurses. However, the presence of a negative attitude in approximately one-quarter of participants indicates that opportunities remain to strengthen professional engagement with HNC prevention and supportive care.

The most notable concern was the relatively low level of good practice. Although 75.8% of participants had adequate knowledge and 73.3% had a positive attitude, only 47.5% demonstrated good practice. Some patient-care practices were reported at relatively high levels, including medication-adherence education (83.0%), encouragement of post-discharge follow-up (82.8%), and oral-hygiene education (83.3%). In contrast, participation in HNC-related CNE/CME during the previous two years was reported by only 56.0%, while regular documentation of suspicious oral findings and updating of HNC guidelines were reported by 62.5% and 62.0%, respectively. These findings suggest that routine patient education may be more consistently incorporated into nursing care than activities requiring continuing professional development, systematic documentation, and regular updating of disease-specific knowledge. Similar knowledge–practice discrepancies have been reported in oncology nursing literature, where barriers such as inadequate knowledge, time constraints, and staffing limitations have been associated with suboptimal implementation of recommended oral-care practices [20].

An important finding was the significant association between previous HNC training and practice. Good practice was observed in 61.2% of nurses who had received previous HNC training compared with 39.5% of those who had not received such training ($p < 0.001$). In contrast, previous HNC training was not significantly associated with knowledge or attitude. Although the cross-sectional design prevents establishing a causal relationship, this association suggests that exposure to HNC-specific training may be particularly relevant to the practical application of recommended care. The finding is supported by an Indian pretest–post-test study among 72 oncology nurses, in which targeted oral-care training improved knowledge and was associated with better implementation of evidence-based oral-care practices and documentation. These findings collectively support the potential value of structured, practice-oriented educational programmes rather than relying exclusively on general oncology awareness.

Interestingly, years of nursing experience were not significantly associated with knowledge, attitude, or practice. This finding suggests that HNC-related competence may not necessarily develop through routine nursing experience alone. Likewise, the absence of an association between previous HNC training and knowledge may reflect differences in the content, duration, timing, or intensity of training received by participants. Therefore, the availability of training alone may be insufficient; the effectiveness of training is likely to depend on its relevance, regularity, practical orientation, and integration with clinical responsibilities.

Age was significantly associated with knowledge, with participants having adequate knowledge being slightly older than those with inadequate knowledge (*p*

= 0.042). However, the observed difference was relatively small and should not be interpreted as evidence of a clinically important age effect. Gender was significantly associated with practice ($p = 0.027$), with good practice reported more frequently among male participants. Because the study was cross-sectional, these associations should be interpreted cautiously. Differences in departmental exposure, workload, clinical responsibilities, patient contact, or other unmeasured factors may contribute to these observations. Neither age nor gender demonstrated significant associations across all three KAP domains.

The questionnaire demonstrated good overall internal consistency, with a Cronbach's alpha of 0.899 for the 33-item instrument. Domain-specific reliability was acceptable for Knowledge ($\alpha = 0.721$), excellent for Attitude ($\alpha = 0.961$), and good for Practice ($\alpha = 0.880$). These findings support the internal consistency of the instrument and provide confidence in its use for assessing HNC-related KAP in the study population. The importance of using structured and psychometrically sound instruments has also been emphasized by recent Indian research. Nawaz et al. (2025) developed and validated a questionnaire for assessing frontline health workers' knowledge, attitudes, and practices regarding the identification of oral premalignant disorders and oral cancer, highlighting the value of contextually appropriate KAP assessment tools [21].

Recent Indian evidence further underscores the importance of disease-specific nursing education. Yadav et al. (2025/2026) reported strong knowledge among nurses regarding the effects of oral cancer on oral hygiene and nutritional status, with nurses working in cancer hospitals demonstrating greater disease-specific knowledge than those in general hospitals [22]. Similarly, the systematic review by Sajwani et al. (2024) concluded that targeted educational interventions are needed to improve nurses' knowledge and practices related to oral care in patients receiving cancer treatment [19]. These findings are consistent with the present study's observation that general knowledge and positive attitudes coexist with deficiencies in specific clinical practices.

The practical implications of these findings are important. Educational interventions should focus not only on increasing knowledge but also on translating knowledge into observable clinical behaviors. HNC-focused continuing nursing education could incorporate practical training in oral examination, recognition and documentation of suspicious lesions, dysphagia and aspiration assessment, chemotherapy-related safety, oral-care management, nutritional counselling, patient education, referral pathways, and multidisciplinary coordination. Periodic refresher sessions, case-based learning, clinical checklists, and reinforcement through institutional protocols may further support sustained implementation in routine practice.

This study has several limitations. Its cross-sectional design limits the ability to establish temporal or causal relationships between training and practice. KAP outcomes were assessed using self-reported responses, which may be influenced by recall and social-desirability bias. In addition, some professional and departmental categories contained relatively few participants, which may reduce the stability of comparisons involving these groups. The nature, duration, and recency of previous HNC training were also not assessed in sufficient detail to determine which training characteristics were most effective. These factors should be considered when interpreting the observed associations.

Overall, the study demonstrates a clear knowledge–practice gap among nursing staff regarding HNC. While approximately three-quarters of participants had adequate knowledge and positive attitudes, fewer than half demonstrated good practice. The significant association between previous HNC training and good practice highlights the potential importance of structured, competency-based education in strengthening the practical application of HNC-related care. Future interventions should therefore prioritize repeated, clinically oriented training and institutional support to improve early recognition, documentation, supportive care, patient education, and multidisciplinary management of patients with HNC.

5.0 Conclusion

This study demonstrated adequate knowledge and positive attitudes but suboptimal clinical practices regarding head and neck cancer among nursing staff. Previous HNC-related training was significantly associated with better practice, highlighting the importance of structured, competency-based continuing education. Strengthening training in early detection, oral assessment, treatment-related complications, patient education, documentation, and multidisciplinary care may help translate existing knowledge and favorable attitudes into effective clinical practice and improve the quality of HNC nursing

DECLARATIONS

Funding statement: The authors declare that no specific funding was received for this study from any public, commercial, or not-for-profit funding agencies.

Acknowledgement: The authors would like to thank colleagues and mentors who provided valuable academic guidance and support during the preparation of this article. The authors also acknowledge the researchers whose published studies contributed to the data and scientific insights discussed in this article.

Conflict of Interest: The authors declare that they have no competing interests related to this work.

Ethical Considerations: The study protocol was reviewed and approved by the Institutional Ethics Committee of the Nims University Rajasthan (Approval No. NIMSUR/IEC/P-848/2024). All procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Consent to Participate: Written informed consent was obtained from all individual participants included in the study prior to their participation.

Consent to Publish: Not applicable.

Authors' Contributions: P.G: Conceptualization, Methodology, Data Curation, Investigation, Formal Analysis, Writing – Original Draft Preparation; S.C: Supervision, Methodology, Validation, Writing – Review & Editing; S.D: Formal Analysis, Data Interpretation, Validation, Writing – Review & Editing; Y. K.S: Resources, Investigation, Data Curation, Writing – Review & Editing; A.S: Conceptualization, Supervision, Project Administration, Validation, Writing – Review & Editing

All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Data Availability Statement: The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request. The data are not publicly available due to institutional and participant confidentiality requirements.

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