Knowledge, Attitude, and Practice Regarding Chemotherapy among Cancer Patients in a Tertiary Care Centre: A Descriptive Cross-Sectional Study

Bibek Kandel[1], Sagar Tiwari[2], Jay Bhushan Jha[2], Prechan Thapaliya[1], Guru Sharan Sah[1]

[1]B. P. Koirala Memorial Cancer Hospital, Chitwan, Nepal.
[2]Bharatpur Central Hospital, Chitwan, Nepal

ABSTRACT

Introduction: Cancer is a leading cause of morbidity, and chemotherapy remains a principal treatment. Its effectiveness depends on patients' understanding of the treatment and self-care practices. The study aimed to find out the level of knowledge, attitude, and practice regarding chemotherapy among cancer patients attending a tertiary care center.

Methods: A descriptive cross-sectional study was conducted at a tertiary care hospital in Chitwan, Nepal, from January 2024 to June 2024. Ethical clearance was obtained from the Institutional Review Committee. A convenience sampling method was used to select 110 participants. Data was entered into Microsoft Excel 2016 and analyzed using the Statistical Package for the Social Sciences version 20.0. Point estimate at 95% Confidence Interval was calculated along with frequency and percentages for binary data and mean and standard deviation for continuous data.

Results: Out of 110 participants, 90 (81.82%) had a poor level of knowledge regarding chemotherapy. The mean ± SD was 44.49 ± 14.39 years. Regarding attitude, 74 (67.27%) maintained a neutral attitude, while 58 (52.73%) completely agreed with the need for health education. For practice, 67 (60.91%) demonstrated poor self-care practices, and follow-up to the hospital on time was observed in 109 (99.09%).

Conclusions: Patients receiving chemotherapy demonstrated low knowledge and poor self-care practices, despite maintaining a neutral attitude and expressing a strong willingness to receive health education.

Keywords: *attitude; chemotherapy; knowledge; Nepal; practice.*

Introduction

Cancer is a leading cause of morbidity and mortality worldwide and represents a growing public health burden.[1] Chemotherapy is one of the principal treatment modalities for cancer, targeting rapidly dividing malignant cells but also affecting normal tissues, resulting in significant adverse effects.[2] The effectiveness and safety of chemotherapy depend not only on pharmacologic factors but also on patients' understanding of treatment regimens, potential side effects, and appropriate self-care practices.[3] Inadequate knowledge may lead to poor adherence, delayed reporting of complications, and reduced treatment efficacy.[4]

Despite advancements in cancer therapy, studies from different regions have reported gaps in patients' knowledge and self-management practices related to chemotherapy.[5-7] Health literacy, and access to information have been shown to influence patients' comprehension and engagement in care.[3,6,8] However, evidence remains limited in Nepal, with only a small number of single-center studies addressing chemotherapy awareness and side-effect management knowledge.[6,7]

The study aimed to find out the level of knowledge, attitude, and practice regarding chemotherapy among cancer patients attending a tertiary care centre.

Methodology

A descriptive cross-sectional study was conducted to evaluate the knowledge, attitude, and practice (KAP)

Correspondence: Guru Sharan Sah, B. P. Koirala Memorial Cancer Hospital, Chitwan, Nepal.

regarding chemotherapy among cancer patients. The study population comprised patients diagnosed with cancer who were actively receiving chemotherapy regimens. A convenience sampling method was used to select the participants for the study. The study was conducted at a tertiary care hospital in Chitwan, Nepal, specifically targeting patients attending the out-patient department (OPD), day care, and in-patient department (IPD). The study was conducted between January 2024 and June 2024.

Ethical clearance was obtained from the Institutional Review Committee before the commencement of data collection. The inclusion criteria comprised cancer patients who provided informed consent, were actively receiving chemotherapy at the study site, and were physically and mentally capable of comprehending the questionnaire. The exclusion criteria included patients who were critically ill with an altered mental status that precluded their ability to participate.

The dependent variables for this study were the levels of Knowledge, Attitude, and Practice regarding chemotherapy. The independent variables included socio-demographic and clinical characteristics such as age, sex, caste, occupation, income, and cancer stage. Operational definitions for the outcomes were based on standard categorizations. To quantify the outcomes, raw scores from the questionnaire were converted into percentages and categorized using the standard Modified Bloom's cut-off criteria. Outcomes were defined as "Good/Positive" for scores between 80% and 100%, "Moderate/Neutral" for scores between 60% and 79%, and "Poor/Negative" for scores below 60%.

Data were collected using a self-administered KAP questionnaire regarding chemotherapy use, originally designed and validated by Wang et al. The questionnaire comprised 25 questions divided into three domains: Knowledge (14 items), Attitude (5 items), and Practice (6 items). The knowledge ranged from 0 to 14, utilizing multiple-choice questions where 1 point was awarded for a correct answer and 0 for an incorrect answer. The attitude domain used a 5-point Likert scale ranging from strongly disagree to strongly agree, with total scores ranging from 5 to 25. The practice domain scored from 0 to 6, with 1 point awarded for clinically appropriate self-care actions. Before data collection, the aim and method of the study were explained to the patients, and written informed consent was obtained. Participants were then provided with the form to record their socio-demographic details, clinical history, and KAP responses.

Following data collection, the raw data were coded, checked for completeness, and entered into Microsoft Excel 2016. The final data set was then imported into the Statistical Package for the Social Sciences version 20.0 for statistical analysis.

Results

The study included a total of 110 participants. The mean age of the participants was 44.49±14.39 years. There were 66 (60.00%) female participants and 44 (40.00%) male participants (Table 1). A total of 90 (81.82%) participants were Hindu, and 90 (81.82%) participants were married. Regarding education, 37 (33.64%) participants were illiterate, and 35 (31.82%) participants had completed primary education. For family income, 74 (67.27%) participants earned 1 lakh rupees or below (Table 1).

Table 1: Socio-Demographic Characteristics of Participants

Variable	Category	N (%)
Age (years)*	Mean±SD	44.49±14.39
Sex	Female	66 (60.00%)
	Male	44 (40.00%)
Religion	Hindu	90 (81.82%)
	Muslim	12(10.91%)
	Christian	4 (3.64%)
	Buddhist	4 (3.64%)
Marital Status	Married	90 (81.82%)
	Single	14 (12.73%)
	Separated	1 (0.91%)
	Widowed	5 (4.55%)
Education	Illiterate	37 (33.64%)
	Primary	35 (31.82%)
	Lower Secondary	13 (11.82%)
	SLC	11 (10.00%)
	Higher Secondary	8 (7.27%)
	Graduate	6 (5.45%)
Family Income	<1 lakh	74 (67.27%)
	1–5 lakhs	36 (32.73%)

*Age is presented as Mean ± SD; SD: Standard Deviation; N: Number of Participants; %: Percentage.

The assessment of overall Knowledge, Attitude, and Practice levels demonstrated varying outcomes (Table 2). There were 90 (81.82%) participants categorized with a poor level of knowledge. A

moderate level of knowledge was observed in 19 (17.27%) participants. Regarding attitude, 74 (67.27%) participants maintained a neutral attitude, and 22 (20.00%) participants held a positive attitude. For the practice domain, 67 (60.91%) participants were categorized as having poor practice, and 18 (16.36%) participants demonstrated good practice (Table 2).

Table 2: Overall Level of Knowledge, Attitude, And Practice

Domain	Category / Level	n(%)
Knowledge*	Poor	90(81.82%)
	Moderate	19(17.27%)
	Good	1(0.91%)
Attitude†	Negative	14(12.73%)
	Neutral	74(67.27%)
	Positive	22(20.00%)
Practice‡	Poor	67(60.91%)
	Moderate	25(22.73%)
	Good	18(16.36%)

*Knowledge assessed via 14 items; Attitude assessed via 5 items; Practice assessed via 6 items; n: Number Of Participants; %: Percentage.

The item-wise responses for the knowledge domain revealed specific areas of understanding. There were 108 (98.18%) participants who identified the correct action for nausea and vomiting, and 97 (88.18%) participants recognized the need to drink more water (Table 3). A total of 0 (0.00%), (Table 3) participants knew their whole chemotherapy regimen. There were 29 (26.36%) participants who correctly identified with their chemotherapy drug names, and 31 (28.18%) participants recognized the appropriate action for low white blood cell counts (Table 3).

Table 3: Item-Wise Responses for Knowledge Domain

Question*	Correct n (%)	Incorrect / Don't Know n (%)
Q1. Know whole regimen?	0(0.00%)	110(100.00%)
Q2. Know chemo drug names?	29(26.36%)	81(73.64%)
Q3. Harmful to tissue on leak?	60(54.55%)	50(45.45%)
Q4. Action for nausea/vomiting	108(98.18%)	2(1.82%)
Q5. Hair loss regenerates?	57(51.82%)	53(48.18%)
Q6. Action for fever > 38°C	36(32.73%)	74(67.27%)
Q7. Action for low WBC	31(28.18%)	79(71.82%)
Q8. Symptoms of low platelets	38(34.55%)	72(65.45%)
Q9. Action for low platelets	35(31.82%)	75(68.18%)
Q10. Action for oral ulcer	32(29.09%)	78(70.91%)
Q11. Action for peculiar taste	91(82.73%)	19(17.27%)
Q12. Action for diarrhea	36(32.73%)	74(67.27%)
Q13. Action for constipation	64(58.18%)	46(41.82%)
Q14. Drink more water?	97(88.18%)	13(11.82%)

*Q: Question; WBC: White Blood Cells; °C: Degree Celsius; n: Number Of Participants; %: Percentage.

Responses for the attitude and practice domains showed specific behavioral patterns. In the attitude domain, 58 (52.73%) participants completely agreed with wanting health education on chemotherapy, and 53 (48.18%) participants agreed that side effects disappear post-chemotherapy (Table 4). In the practice domain, 61 (55.45%) participants reported never drinking alcohol, and 46 (41.82%) participants reported never smoking. Regarding self-care actions, 109 (99.09%) participants demonstrated good practice in returning to the hospital on time, and 77 (70.00%) participants identified the correct action for drug leakage (Table 4).

Table 4: Item-Wise Responses for Attitude and Practice Domains

Domain / Question*	Response Option	N (%)
Attitude		
Q15. Side effects disappear	Completely agree	30(27.27%)
	Agree	53(48.18%)
	Neutral	11(10.00%)
	Disagree	16(14.55%)
Q16. Nausea/Vomiting is preventable	Completely agree	16(14.55%)
	Agree	52(47.27%)
	Neutral	21(19.09%)
	Disagree	20(18.18%)
	Strongly disagree	1(0.91%)
Q17. Self-care reduces reactions	Completely agree	17(15.45%)
	Agree	46(41.82%)
	Neutral	27(24.55%)
	Disagree	19(17.27%)
	Strongly disagree	1(0.91%)
Q18. Analgesics cause addiction	Completely agree	23(20.91%)
	Agree	49(44.55%)
	Neutral	29(26.36%)
	Disagree	9(8.18%)
Q19. Wanting health education	Completely agree	58(52.73%)
	Agree	42(38.18%)
	Neutral	5(4.55%)
	Disagree	5(4.55%)
Practice		
Q20. Do you drink alcohol?	Current	5(4.55%)
	Past	43(39.09%)
	Never	61(55.45%)
	I don't know	1(0.91%)

Domain / Question*	Response Option	N (%)
Q21. Do you smoke?	Current	19(17.27%)
	Past	42(38.18%)
	Never	46(41.82%)
	I don't know	3(2.73%)
Q22. Action for drug leakage	Good Practice	77(70.00%)
	Poor / Don't Know	33(30.00%)
Q23. Appropriate hair loss action	Good Practice	17(15.45%)
	Poor / Don't Know	93(84.55%)
Q24. Action during fatigue	Good Practice	25(22.73%)
	Poor / Don't Know	85(77.27%)
Q25. Return to hospital on time	Good Practice	109(99.09%)
	Poor / Don't Know	1(0.91%)

*Q: Question; n: Number of Participants; %: Percentage.

The frequency distribution across the three domains provides a visual representation of the categorical levels of Knowledge, Attitude, and Practice observed among the participants (Figure 1).

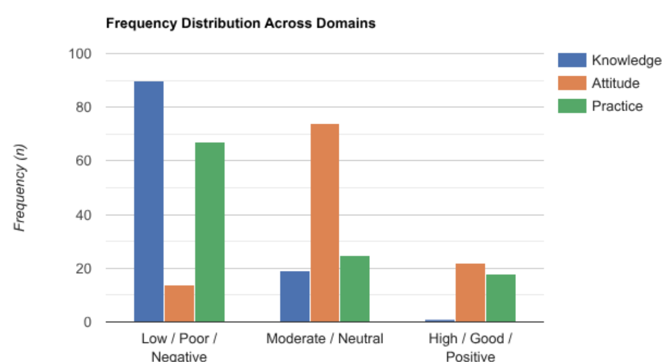

Figure 1: Overall, Knowledge, Attitude, And Practice Levels

Discussion:

In this cross-sectional assessment of chemotherapy-related knowledge, attitude, and practice among cancer patients receiving treatment in a tertiary care hospital in Chitwan, Nepal, three clinically meaningful patterns emerged. First, overall knowledge and self-care practice were low, indicating that many patients may be receiving chemotherapy without a sufficient understanding of regimen-related basics and several high-risk toxicities. Second, attitudes clustered largely in a neutral range, yet patients expressed a strong desire for chemotherapy education, suggesting that limited knowledge reflects modifiable informational gaps rather than disengagement. Third, item-level responses showed a selective knowledge pattern: awareness was higher for some common symptom domains, while knowledge was weaker for complications that require timely treatment.

These findings have direct clinical relevance because chemotherapy safety depends not only on prescribing and monitoring, but also on patient recognition of danger symptoms, adherence to supportive care behaviors, and timely reporting: particularly as the cancer burden continues to rise globally.[1]

A pivotal finding of this study is the discrepancy between hospital-directed compliance and patient-led self-care. While patients demonstrated excellent adherence to clinical appointments (99.09%), they lacked the necessary preparedness to manage severe adverse effects independently. This highlights a critical vulnerability in home care, where patients are required to act as primary responders to escalating toxicities without adequate health literacy.[2]

The observed gaps may reflect informational and contextual factors common in low- and middle-income settings, where high patient volume, constrained staffing, limited counseling time, and inconsistent educational materials can affect structured education delivery.[9] In addition, chemotherapy information is cognitively demanding, and knowledge is based on health literacy and socioeconomic context; patients may receive information but not convert it into actionable rules for home monitoring and escalation.[3,8]

Finally, the largely neutral attitude distribution with willingness to receive education suggests uncertainty rather than resistance. This matters clinically because neutral attitudes may reflect limited self-efficacy and ambiguity about what is preventable through self-care.[4]

Our overall pattern shows low knowledge and weaker practice with comparatively more favorable attitudes toward education which resembles findings from a large chemotherapy KAP study in Pakistan (n=390), which reported low knowledge and practice scores but relatively better attitudes, and emphasized education as an important determinant of KAP differences.[5] While the direction is consistent, the depth of regimen-level knowledge deficits in our

cohort points toward the need to evaluate how, when, and by whom chemotherapy education is delivered.

Within Nepal, our findings differ from a Kathmandu-based study (n=103) where nearly half of patients demonstrated moderate chemotherapy knowledge and chemotherapy cycle exposure was associated with access to health information, suggesting that repeated exposure and information access can improve understanding when reinforcement occurs.[6] Our results also align with a Bhaktapur-based study (n = 104) showing that knowledge gaps persisted in specific high-priority domains such as extravasation and hair fall management, which may again point the likelihood of recurring educational illiteracy across Nepali contexts.[7]

A regional comparison further supports the plausibility that knowledge deficits translate into weaker self-care. An Indian cross-sectional study (n = 100) reported a moderate positive correlation between knowledge of chemotherapy adverse effects and self-care ability (r = 0.55), supporting the fact that strengthening knowledge can improve practical self-management behaviors and reduce symptom burden.[4] Although causal conclusions cannot be drawn from our cross-sectional design of that study, the coexistence of low knowledge and poor practice is consistent with this relationship.[4]

Importantly, KAP gaps are not limited to patients. A rural Bangladesh study among community health care providers and health assistants (n = 325) documented only moderate KAP performance and limited formal training, implying that system-level education capacity can remain insufficient even among healthcare workers.[10] This is relevant because patient education quality is dependent on workforce training, time constraints, and availability of standardized counseling tools.

Evidence from higher-resource systems emphasizes that chemotherapy knowledge is modifiable through structured education and repeated reinforcement. A Norwegian longitudinal study demonstrated meaningful improvements in objective knowledge across repeated consultations and improvements in perceived information and satisfaction, supporting the value of systematic clinician engagement and written materials.[11] In parallel, a US outpatient study among women with breast cancer found high chemotherapy knowledge after a mandatory education session, with health literacy and income remaining important predictors of knowledge, highlighting that education delivery must be designed for literacy sensitivity and equity.[3]

Just like our study, a study from Oman found that patients really want to learn more about their chemotherapy. Even patients who are good at understanding health information felt that their education was lacking. This proves that the way we teach patients often misses the mark, it mayn't focus on what they care about or what they can understand.[8]

Emotional and social concerns change what patients pay attention to. A study in Japan showed that patients often care more about how chemo affects their family life than they do about their own physical symptoms. Because of this, they might ignore the technical medical rules unless their doctor explains that following those rules is the best way to keep being there for their family.[13]

In newly diagnosed patients receiving chemotherapy, only about half correctly understood chemotherapy goals, and education level predicted accurate goal perception, reinforcing the role of education in meaningful understanding.[12] Likewise, a large multinational prospective study in advanced lung cancer demonstrated low understanding between patient-reported chemotherapy priorities and physician perception of those priorities, suggesting that clinicians may misjudge patient preferences unless they are explicitly elicited and confirmed.[14]

Differences across studies in sampling strategy, patient mix, timing relative to chemotherapy cycles, and measurement tools likely explain variation in reported KAP levels. Our use of Modified Bloom's cut-offs is common in KAP research but remains imperfectly comparable with studies using alternative thresholds or different knowledge/practice item pools.[5-7] Self-reported practice responses may also be influenced by social desirability and by whether a behavior is system-driven (appointment adherence) versus patient-driven (home symptom monitoring and action).[3]

These findings of this study support positioning chemotherapy education as a patient-safety

intervention rather than an optional adjunct. Education should prioritize knowledge gaps that most directly affect morbidity: fever thresholds and urgent reporting, infection precautions in suspected neutropenia, bleeding-risk recognition, oral ulcer care, and clear action plans for suspected extravasation.[2,4] Longitudinal evidence indicates that reinforcement across visits improves objective knowledge and reduces unmet information needs, supporting cycle-by-cycle education rather than one-time counseling.[11]

In resource-limited settings, feasible approaches include nurse-led standardized counseling protocols, pictorial or audio-visual materials in the local language, caregiver co-education, and teach-back confirmation to verify comprehension.[3,8] Integrating psychosocial counseling can further improve engagement and self-efficacy, consistent with patient-centered models emphasizing empowerment and coping in cancer care.[15]

This study provides a pragmatic profile of chemotherapy-related KAP among actively treated patients in a real-world tertiary care setting in Nepal. The use of standardized operational categorization and item-wise analysis helps identify specific educational blind spots with direct applicability to counseling content and clinic workflow improvements.

The descriptive cross-sectional design limits causal inference and cannot confirm whether low knowledge causes poor practice, although external evidence supports this relationship.[4] The single-center convenience sample limits generalizability to other Nepali settings, particularly specialized cancer centers. Self-reported measures may introduce recall and social desirability bias, especially for practice behaviors. Finally, direct measurement of health literacy and detailed treatment exposure (cycle number, regimen complexity, intent) would strengthen explanatory inference and should be incorporated in future studies.[3,6]

Conclusion

We found low knowledge and inconsistent self-care practices coexisted with a strong willingness to receive chemotherapy education, identifying a clear and actionable safety gap.

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