



Knowledge, Attitudes, and Practices: Preventing Delayed CINV with Antiemetics

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ABSTRACT

Introduction: Chemotherapy-induced nausea and vomiting (CINV) is the most feared side effect by cancer patients. To prevent and minimize the occurrence of delayed CINV, patients are given post-chemotherapy antiemetics. Adequate patient knowledge is essential for promoting awareness of CINV and the appropriate use of post-chemotherapy antiemetics. This study examines the knowledge, attitudes, and practice of cancer patients towards the occurrence of delayed CINV and the use of post-chemotherapy antiemetics.

Methods: Descriptive cross-sectional study conducted in the chemotherapy room at Hospital X, South Kalimantan, Indonesia. The study was conducted in September-November 2024. Face-to-face interviews guided by a structured questionnaire were conducted on 114 cancer patients.

Results: The study revealed that patient knowledge regarding the side effects of CINV and the use of post-chemotherapy antiemetics was generally limited. Specifically, 49 respondents (43%) demonstrated a basic level of knowledge, 35 respondents (30.7%) showed sufficient knowledge, and 30 respondents (26.3%) exhibited good knowledge. Patients with higher education levels demonstrated significantly higher scores in both the attitude domain (3.31 ± 1.277) and the practice domain (3.75 ± 1.223).

Conclusion: Healthcare professionals play a crucial role in educating patients on the appropriate use of antiemetic medications. Effective education aims to enhance chemotherapy patients' knowledge, attitudes, and practices regarding the use of post-chemotherapy antiemetics.

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INTRODUCTION

Chemotherapy-induced nausea and vomiting (CINV) remains a significant and persistent complication, affecting approximately 40% to 80% of patients undergoing chemotherapy treatment (1). This debilitating side effect can lead to alterations in chemotherapy regimens or a reduction in the effectiveness of oral treatments, consequently diminishing the overall efficacy of cancer therapy in up to 40% of patients (1). Based on its temporal presentation, CINV is clinically categorized into three distinct phases: acute, delayed, and breakthrough (2). Acute CINV typically manifests within the first 1 to 2 hours post-chemotherapy administration, reaching peak intensity between 4 and 6 hours. In contrast, delayed CINV emerges more than 24 hours after treatment, characteristically peaking between 48 and 72 hours and gradually subsiding over the subsequent 2 to 3 days (3). Breakthrough CINV, on the other hand, occurs in patients who have experienced significant CINV despite prophylactic antiemetic treatment during previous chemotherapy cycles (4).

Several studies have documented the incidence of CINV. For instance, Hilarius *et al.* (5) reported that approximately 45-65% of patients undergoing chemotherapy experienced delayed nausea, while 15-25% experienced delayed vomiting. Similarly, Escobar *et al.* (6), in a study of 103 patients, found that 20.8% experienced at least one episode of vomiting and 42% reported nausea within 120 hours following chemotherapy administration. Building upon this body of evidence, our previous research (7) revealed a substantial prevalence of severe delayed CINV, affecting 55.3% (63 out of 114) of patients receiving both anthracycline and non-anthracycline-based chemotherapy regimens.

Despite the expanding understanding of the pathophysiology of CINV and the ongoing development of novel antiemetic agents, CINV remains a prevalent concern among cancer patients (8). The emetogenic potential of the specific chemotherapy drugs administered represents a significant factor influencing the frequency of CINV. Consequently, patients undergoing chemotherapy frequently require concurrent administration of antiemetic medications. Established guidelines recommend that the selection and administration of antiemetics in chemotherapy patients should be guided by the emetogenic risk level associated with the prescribed chemotherapy regimen to effectively prevent the onset of nausea and vomiting (9).

While often transient, CINV can generally be prevented or significantly minimized through appropriate antiemetic treatment strategies (10). Despite this, a common issue in clinical practice arises from the fact that many chemotherapy regimens do not induce acute nausea and vomiting. Consequently, patients frequently tend to forgo the use of prescribed antiemetics following chemotherapy until they actually experience these distressing symptoms. This practice often stems from a lack of awareness regarding the crucial role of prophylactic antiemetic regimens in preventing the onset of delayed nausea and vomiting, as well as mitigating their potentially severe consequences (9). Addressing this knowledge gap is essential for optimizing patient adherence to antiemetic therapies and ultimately improving their overall treatment experience.

Numerous studies have investigated the knowledge, attitudes, and practices of healthcare professionals concerning the treatment and management of CINV. However, a relative paucity of research has focused on evaluating these parameters from the patient's perspective, particularly within the Indonesian context. Addressing this gap, the present study aimed to explore patients' knowledge, attitudes, and practices specifically related to the use of antiemetic medications for the prevention or minimization of delayed CINV.

METHOD

Research Type

A cross-sectional descriptive study was conducted to assess the knowledge, attitudes, and practices of chemotherapy patients regarding the use of antiemetics for the prevention of CINV.

Population and Sample/Informants

Participants were recruited using a convenience sampling method based on their availability, willingness to participate, geographic proximity, and ease of access. This non-random sampling approach resulted in the inclusion of 114 cancer patients who had been receiving chemotherapy for more than two months and were attending Hospital X for their scheduled chemotherapy treatment, as determined by their cancer stage and type. The study included cancer patients meeting the following criteria: aged between 18 and 65 years, and receiving chemotherapy regimens categorized as having moderate or high emetogenic potential. Patients were excluded if they were undergoing

chemoradiation therapy or had documented mental incapacitation or significant emotional disturbances that could impede their ability to provide informed consent and complete the questionnaire accurately.

Research Location

The study population comprised patients undergoing chemotherapy at Hospital X, South Borneo, Kalimantan. Data collection spanned from September to November 2024 and employed a questionnaire-based survey.

Instrumentation or Tools

The data collection instrument comprised a structured questionnaire administered to participants. The first section of the questionnaire gathered sociodemographic information, specifically age, gender, educational attainment, and employment status. The subsequent section employed a self-administered Knowledge, Attitude, and Practice (KAP) questionnaire focusing on CINV and the utilization of antiemetic medications following chemotherapy. The primary objective of the KAP questionnaire was to assess participants' comprehension of CINV as a side effect of chemotherapy and their understanding of the rationale behind post-chemotherapy antiemetic use.

The questionnaire encompassed three distinct domains: Knowledge, Attitude, and Practices, totalling 41 items. The Knowledge domain consisted of 21 true-false questions, with scoring ranging from 0 to 21 (0 indicating an incorrect response and 1 indicating a correct response). The Attitude domain included 10 items, each employing a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = do not know, 4 = agree, 5 = strongly agree), resulting in a potential score range of 10 to 50. Similarly, the Practice domain comprised 10 items utilizing a five-point frequency scale (1 = very rarely, 2 = rarely, 3 = do not know, 4 = often, 5 = very often), yielding a possible score range of 10 to 50.

Data Collection Procedures

To establish the validity of the patient knowledge assessment questionnaire, a correlational analysis was conducted on data collected from 73 respondents. Specifically, the Corrected Item-Total Correlation coefficient was calculated for each item, employing 95% confidence level. An item was considered valid if its correlation coefficient exceeded the critical r -value of 0.235 (r table for $n=73$, $\alpha=0.05$, two-tailed). The results of this analysis indicated that all questionnaire statements demonstrated a correlation coefficient above this threshold, thus confirming the construct validity of the instrument.

In addition to assessing validity, the reliability of the questionnaire was evaluated using Cronbach's Alpha. Reliability analysis of the collected data yielded a Cronbach's Alpha coefficient of 0.846. According to established psychometric criteria, a Cronbach's Alpha value of 0.60 or higher is generally considered acceptable for research instruments.

Data Analysis

The collected data were analyzed using SPSS for Windows, version 20.0. Descriptive statistical methods, including the calculation of the mean, median, frequency, percentage, and standard deviation, were employed to summarize the characteristics of the study sample and the distribution of relevant variables.

Ethical Approval

The Research Ethics Commission approved this study at Ulin General Hospital, Banjarmasin, Indonesia, under reference number 246/XII-Reg-Riset/RSUDU/23. All participants, including parents or guardians for participants under 18, provided informed consent prior to participating in the study. The confidentiality of all participants was strictly maintained throughout the research process.

RESULTS

This study enrolled 114 patients undergoing chemotherapy regimens classified as having moderate to high emetogenic potential. The demographic profile of the study cohort revealed that 102 participants (89.5%) were female, and a significant proportion, 82 patients (71.9%), were within the age range of 41 to 60 years. The primary cancer diagnosis among the participants was breast cancer, affecting 70 individuals (61.4%), and 67 patients (58.8%)

reported having a high school education as their highest level of educational attainment. A comprehensive presentation of the patients' socio-demographic characteristics is detailed in Table 1.

Table 1. Socio-demographic characteristics of patients (n=114)

Characteristics		Frequency	%
Gender	Male	12	10.5
	Female	102	89.5
Age (years)	18-40	25	21.9
	41-60	82	71.9
	>60	7	6.1
Educational status	Primary	4	3.5
	Secondary	12	10.5
	Higher	67	58.8
	Bachelor	31	27.2
Employment status	Working full time	22	19.3
	Working part time	65	57.1
	Retired	27	23.7
Site of primary malignancy	Breast	74	64.9
	Gynecological	26	22.8
	Lymph	9	7.9
	Lung	5	4.4

Based on the analysis of 21 valid statements, patient knowledge was assessed using a binary scoring system: a score of 1 was assigned for each correct response, and 0 for each incorrect response. The total knowledge score for each patient was calculated as the sum of their correct answers. Subsequently, patients were categorized into three knowledge levels based on their total score percentage: 'good' (76-100%), 'sufficient' (56-75%), and 'poor' (<56%). The detailed distribution of patients across these knowledge levels is visually presented in Figure 1.

Figure 1 illustrates the distribution of patient knowledge regarding the side effects of CINV and the appropriate use of antiemetic medications following chemotherapy. The data reveals a spectrum of understanding among the 114 participants. A notable proportion, 43% (n=49), demonstrated a limited understanding of these aspects. Conversely, 30.7% (n=35) exhibited sufficient knowledge, while a smaller group, 26.3% (n=30), possessed a good level of knowledge regarding CINV side effects and antiemetic utilization. The research findings indicate a notable deficit in patient knowledge regarding CINV and the appropriate use of post-chemotherapy antiemetics. Specifically, 49 participants (43%) demonstrated inadequate understanding across several key knowledge domains.

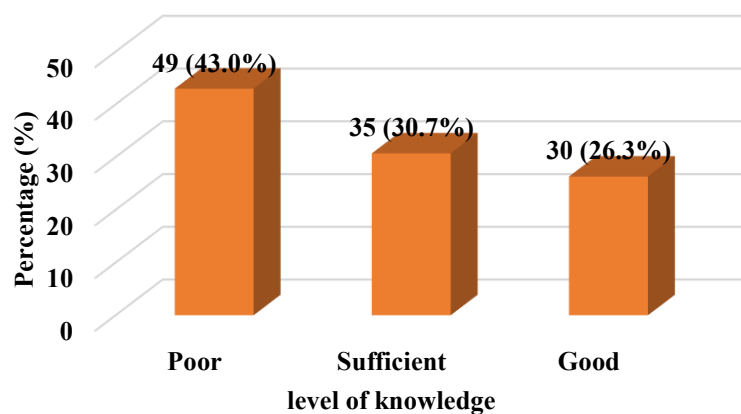


Figure 1. Level of patient knowledge regarding the side effects of nausea and vomiting due to chemotherapy and the use of post-chemotherapy antiemetics (n=114)

As shown in Figure 2, patient knowledge domains encompassed: the nature and characteristics of CINV; strategies for its management; the typical time course of CINV; the importance of timely communication with healthcare providers regarding CINV occurrence; indications for antiemetic drug use; the therapeutic goals of antiemetic therapy; guidelines for antiemetic administration; proper management of missed doses; the potential consequences of non-compliance with antiemetic regimens; and the critical importance of consulting with a physician or pharmacist prior to initiating any concomitant medications.

The study revealed significant knowledge gaps among the participants regarding two key aspects of CINV management. A substantial proportion, 87 patients (76.3%), demonstrated a lack of awareness concerning the importance of informing their physicians about their experience of nausea and vomiting. Furthermore, 75 respondents (65.8%) exhibited inadequate knowledge about the potential consequences of not adhering to their prescribed antiemetic medication regimens.

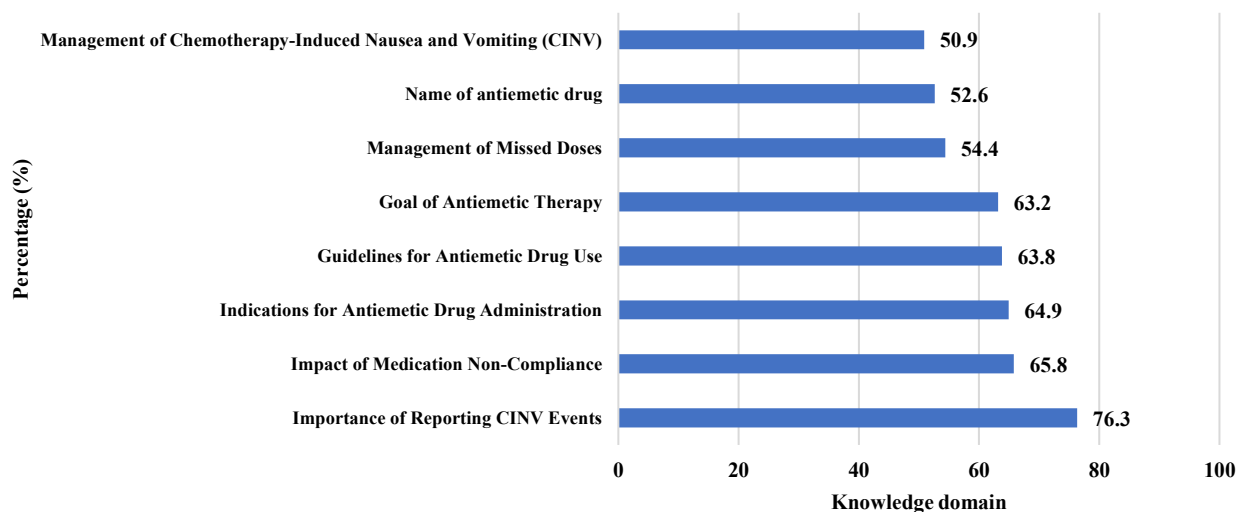


Figure 2. Patient knowledge domain responses that exhibited a high percentage of errors (n=114)

Table 2 indicates that the majority of patients (3.31 ± 1.277) acknowledge the importance of receiving an explanation regarding the potential risk of nausea and vomiting associated with chemotherapy. However, the study results also reveal that patients (2.66 ± 1.181) tend to use antiemetics reactively, administering the medication only upon experiencing nausea and vomiting.

Table 2. Chemotherapy Patients' Attitudes towards CINV and Antiemetic Use

Attitude	Mean	SD
Importance of Explaining CINV Risk	3.31	1.277
Patient Intent to Report CINV	3.05	1.128
Patient Reluctance to Adhere to Antiemetic Regimen Due to Fear of Toxicity	3.19	1.112
Patient Access to Healthcare Workers for CINV Reporting	2.98	1.137
Patient Prioritization of Cancer Treatment Over CINV Management	3.11	1.170
Medication Adherence Due to Belief in Efficacy	3.04	1.240
Patient Reporting of CINV Upon Inquiry	2.93	1.315
Patient's Unrestricted Medication Use	3.12	1.168
Patient Perception of Chemotherapy Modification Due to CINV	3.18	1.194
Take antiemetics after feeling nauseous and vomiting	2.66	1.181

Table 3 indicates that patients (3.75 ± 1.223) reported a high level of attention to physician explanations regarding the potential risk of post-chemotherapy nausea and vomiting. Patients expressed feeling more cared for when provided with this information. However, a significant proportion of patients (2.51 ± 1.033) reported

prioritizing their cancer treatment over the management of CINV. This tendency has the potential for negative health consequences, as inadequately managed CINV can lead to complications such as anorexia, weight loss, malnutrition, and electrolyte imbalance. These complications, in turn, may result in extended treatment durations, increased financial burden, and heightened stress, all of which can significantly impair patients' quality of life.

Table 3. Chemotherapy Patients' Practices towards CINV and Antiemetic Use

Practice	Mean	SD
Patient Attention to Explanation of CINV Risk	3.75	1.223
Patient Willingness to Report CINV	3.10	1.182
Patient Reluctance to Adhere to Antiemetic Regimen Due to Fear of Drug Interactions	2.78	1.302
Patient Intention for Prompt Reporting of CINV	3.11	1.150
Patient Prioritization of Cancer Treatment Over CINV Management	2.51	1.033
Patient Optimism Regarding Medication Efficacy	3.13	1.164
Underreporting of CINV Due to Lack of Inquiry	2.68	1.007
Patient's Restricted Medication Use	2.74	1.205
Patient Fear of Treatment Interruption Due to Reporting CINV	3.13	1.194
Consistent adherence to their prescribed antiemetic medication	2.97	1.230

DISCUSSION

A significant finding was the prevalence of patient unawareness regarding the importance of reporting CINV to their physicians. This appears to stem from a perception, noted by Vidall *et al.* (11), that nausea and vomiting are inevitable side effects of chemotherapy. Furthermore, some patients expressed concern, as highlighted by Barbor (12), that reporting CINV might lead to alterations in their chemotherapy regimen or delays in subsequent treatment cycles. Additionally, patients reported a lack of accessible mechanisms for reporting CINV symptoms once they had returned home, indicating a potential disconnect in communication between patients and healthcare providers in the outpatient setting.

A common misconception was that antiemetic medications are only necessary upon the onset of nausea and vomiting. Patients frequently did not recognize that these regimens are designed to prevent the occurrence of delayed CINV and its potential exacerbation. While the precise relationship between acute and delayed CINV remains under investigation (10), evidence suggests that effective control of acute CINV may mitigate the severity of subsequent delayed episodes (13). However, as Rapoport (14) and Apro *et al.* (15) have noted, the occurrence of acute CINV is not a definitive predictor of delayed CINV, and delayed CINV can manifest even in patients who do not experience the acute phase. Therefore, the administration of post-chemotherapy antiemetics is crucial for the prevention and minimization of delayed CINV.

Discrepancies exist between healthcare professionals' perceptions and patients' self-reported adherence to antiemetic regimens. Vidall *et al.* (11) reported that while healthcare professionals estimate over 50% patient compliance with prophylactic antiemetics for delayed CINV, only 42% of patients confirm this adherence. This discrepancy is attributed to patients not adhering to prescribed instructions, often due to a lack of understanding regarding the preventive purpose of these medications (16). Patients frequently take antiemetics only reactively, upon experiencing nausea and vomiting. Feyer *et al.* (1) emphasize that improving patients' understanding of CINV is crucial to enhance antiemetic compliance. Furthermore, Vidall *et al.* (11) found that over 50% of patients experiencing CINV are reluctant to report it to healthcare professionals, likely due to limited access to reporting mechanisms and a belief that nausea and vomiting are unavoidable consequences of cancer treatment (17). To facilitate CINV monitoring, Kaupp *et al.* (18) suggest that pharmacists provide patients with diaries to document their experiences, which can enhance patients' sense of security and trust, allowing them to indirectly express fears and anxieties. Identified barriers to effective patient education include lack of time, human resources, busy work environments, and privacy (12). Rha *et al.* (19) note that some patients forget to take antiemetics when feeling well, while others avoid them due to fear that swallowing the pills will induce nausea or vomiting.

Healthcare professionals emphasize that patient education regarding post-chemotherapy antiemetic use should be individualized, taking into account the emetogenic potential of the specific chemotherapy regimen (20). Furthermore, Lorusso (21) suggests that additional risk factors, such as age, gender, history of vomiting in previous

cycles, and a history of motion sickness or morning sickness, should be considered when providing patients with information about their risk of CINV. Providing tailored education has the potential to improve patient knowledge and adherence to antiemetic regimens, thereby reducing the incidence of CINV, particularly in those receiving highly emetogenic chemotherapy (22).

Effective communication between healthcare professionals and patients prior to initiating CINV treatment is crucial to ensure patients understand that CINV is a condition that can be prevented or minimized, rather than merely tolerated (23). Furthermore, assessing the socio-demographic characteristics of chemotherapy patients before delivering education can facilitate the development of more tailored and effective educational programs designed to improve patient knowledge and practices. Therefore, patient-specific differences and individual evaluations should be carefully considered when providing comprehensive CINV education (24).

Several limitations should be considered when interpreting the findings of this study. Firstly, the data were collected from a single urban centre, which restricts the generalizability of the evaluation to the entire Indonesian population. Secondly, the potential for response bias in the attitude and practice sections cannot be entirely excluded, as patients provided their answers in the presence of the researchers. Finally, this study did not explore the potential influence of cancer type, disease stage, or duration of therapy on patients' knowledge, attitudes, and practices regarding their treatment. Future research should investigate these factors to provide a more comprehensive understanding of the issue.

CONCLUSION

Chemotherapy patients demonstrate a significant knowledge deficit regarding the use of post-chemotherapy antiemetics. While their attitudes toward antiemetic use are moderately positive, their practice behaviour is only fair. Providing targeted education to these patients, emphasizing the need for information about chemotherapy and its common side effects, including nausea and vomiting, is crucial. Further interventional studies are warranted to evaluate the impact of such education on improving patient knowledge, attitudes, and practice.

AUTHOR'S CONTRIBUTION STATEMENT

Ratih Pratiwi Sari and Suharjono conceived of the presented idea. Aditya Maulana Perdana Putra verified the analytical methods. Mahardian Rahmadi and Muhammad Darwin Prenggono to investigate and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

Gemini by Google have been employed to support language refinement, enhance clarity, or improve the overall readability and structure of the manuscript.

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BIBLIOGRAPHY

1. Feyer P, Jahn F, Jordan K. Prophylactic Management of Radiation-Induced Nausea and Vomiting. *Biomed Res Int*. 2015;2015:893013. doi: [10.1155/2015/893013](https://doi.org/10.1155/2015/893013). Available from: <https://onlinelibrary.wiley.com/doi/10.1155/2015/893013>
2. Dranitsaris G, Molassiotis A, Clemons M, Roeland E, Schwartzberg L, Dielenseger P, Jordan K, Young A, Aapro M. The development of a prediction tool to identify cancer patients at high risk for chemotherapy-induced nausea and vomiting. *Ann Oncol*. 2017;28(6):1260-7. doi: [10.1093/annonc/mdx100](https://doi.org/10.1093/annonc/mdx100). Available from: [https://www.annalsofoncology.org/article/S0923-7534\(19\)32429-9/fulltext](https://www.annalsofoncology.org/article/S0923-7534(19)32429-9/fulltext)
3. Tsubata Y, Nakao M, Amano Y, Hotta T, Hamaguchi M, Okimoto T, Miura K, Hamaguchi S, Kuraki T, Itakura M, Isobe T. Translational and Randomized Study of 5-HT₃ Receptor Antagonists for Evaluation of Chemotherapy-induced Nausea and Vomiting Related Biomarkers. *J Med Invest*. 2019;66(3.4):269-74. doi: [10.2152/jmi.66.269](https://doi.org/10.2152/jmi.66.269). Available from: https://www.jstage.jst.go.jp/article/jmi/66/3.4/66_269/article
4. Manson E, Routledge PA. Nausea and vomiting. In: Walker R, Whittlesia C, editors. *Clinical Pharmacy and Therapeutics*. 5th ed. China: Churchill Livingstone Elsevier; 2012. pp. 535–44.
5. Baburaj G, Abraham AM, George L, Shetty V, Thempalangad RM, Rajesh KS, Raj KCB. A Study on Utilization and Evaluation of Antiemetics in Chemotherapy-induced Nausea and Vomiting. *Indian J Med Paediatr Oncol*. 2017;38(3):334-9. doi: [10.4103/ijmpo.ijmpo_116_17](https://doi.org/10.4103/ijmpo.ijmpo_116_17). Available from: https://www.thieme-connect.com/products/ejournals/abstract/10.4103/ijmpo.ijmpo_116_17
6. Hilarius DL, Kloeg PH, van der Wall E, van den Heuvel JJG, Gundy CM, Aaronson NK. Chemotherapy-induced nausea and vomiting in daily clinical practice: a community hospital-based study. *Support Care Cancer*. 2012;20(1):107-17. doi: [10.1007/s00520-010-1073-9](https://doi.org/10.1007/s00520-010-1073-9). Available from: <https://link.springer.com/article/10.1007/s00520-010-1073-9>
7. Escobar Y, Cajaraville G, Virizuela JA, Álvarez R, Muñoz A, Olariaga O, Tamés MJ, Muros B, Lecumberri MJ, Feliu J, Martínez P, Adansa JC, Martínez MJ, López R, Blasco A, Gascón P, Calvo V, Luna P, Montalar J, Barrio PD, Tornamira MV. Incidence of chemotherapy-induced nausea and vomiting with moderately emetogenic chemotherapy: ADVICE (Actual Data of Vomiting Incidence by Chemotherapy Evaluation) study. *Support Care Cancer*. 2015;23(9):2833-40. doi: [10.1007/s00520-015-2809-3](https://doi.org/10.1007/s00520-015-2809-3). Available from: <https://link.springer.com/article/10.1007/s00520-015-2809-3>
8. Sari RP, Prenggono MD, Putra AMP, Atmaja DS, Rahmadi M, Suharjo. The efficacy of combining ondansetron with dexamethasone in delayed chemotherapy-induced nausea and vomiting. *Pharm Educ*. 2024;24(3):211–5. doi: [10.46542/pe.2024.243.211215](https://doi.org/10.46542/pe.2024.243.211215). Available from: <https://pharmacyeducation.fip.org/pharmacyeducation/article/view/2703>
9. Gupta K, Walton R, Kataria SP. Chemotherapy-Induced Nausea and Vomiting: Pathogenesis, Recommendations, and New Trends. *Cancer Treat Res Commun*. 2021;26:100278. doi: [10.1016/j.ctarc.2020.100278](https://doi.org/10.1016/j.ctarc.2020.100278). Available from: <https://www.sciencedirect.com/science/article/pii/S2468294220301131?via%3Dihub>
10. Rao KV, Faso A. Chemotherapy-induced nausea and vomiting: optimizing prevention and management. *Am Health Drug Benefits*. 2012;5(4):232-40. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC4046471/>
11. Chan A, Low XH, Yap KYL. Assessment of the relationship between adherence with antiemetic drug therapy and control of nausea and vomiting in breast cancer patients receiving anthracycline-based chemotherapy. *J Manag Care Pharm*. 2012;18(5):385-94. doi: [10.18553/jmcp.2012.18.5.385](https://doi.org/10.18553/jmcp.2012.18.5.385). Available from: <https://pmc.ncbi.nlm.nih.gov/articles/pmid/22663171/>
12. Vidall C, Sharma S, Amlani B. Patient-practitioner perception gap in treatment-induced nausea and vomiting. *Br J Nurs*. 2016;25(16):S4–S11. doi: [10.12968/bjon.2016.25.s4](https://doi.org/10.12968/bjon.2016.25.s4). Available from: https://www.magonlinelibrary.com/doi/abs/10.12968/bjon.2016.25.s4?rfr_dat=cr_pub++0pubmed&url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Aacrossref.org
13. Barbor, M. Role of Pharmacists in the Management of Chemotherapy-Induced Nausea and Vomiting. *J Hematol Oncol Pharm*. 2019;9(2):17788. Available from: <https://jhponline.com/issue-archive/2019-issues/jhop-june-2019-vol-9-no-2/17788:role-of-pharmacists-in-the-management-of-chemotherapy-induced-nausea-and-vomiting>

14. Lively A, Minard LV, Scott S, Deal H, Lambourne T, Giffin J. Exploring the perspectives of healthcare professionals in delivering optimal oncology medication education. *PLoS One*. 2020;15(2):e0228571. doi: [10.1371/journal.pone.0228571](https://doi.org/10.1371/journal.pone.0228571). Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0228571>
15. Rapoport BL. Delayed Chemotherapy-Induced Nausea and Vomiting: Pathogenesis, Incidence, and Current Management. *Front Pharmacol*. 2017;8:19. doi: [10.3389/fphar.2017.00019](https://doi.org/10.3389/fphar.2017.00019). Available from: <https://www.frontiersin.org/journals/pharmacology/articles/10.3389/fphar.2017.00019/full>
16. Aapro M, Scotté F, Escobar Y, Celio L, Berman R, Franceschetti A, Bell D, Jordan K. Practice Patterns for Prevention of Chemotherapy-Induced Nausea and Vomiting and Antiemetic Guideline Adherence Based on Real-World Prescribing Data. *Oncologist*. 2021 Jun;26(6):e1073-e1082. doi: [10.1002/onco.13716](https://doi.org/10.1002/onco.13716). Available from: <https://academic.oup.com/oncolo/article/26/6/e1073/6520983>
17. Gebre D, Murugan R, Bizuwork K, Wurjine TH. Knowledge, practice and perceived barriers towards chemotherapy induced nausea and vomiting in prophylaxis guideline adherence among nurses in oncology units at selected hospitals, in Addis Ababa, Ethiopia, a cross-sectional study. *BMC Nurs*. 2022;21(1):223. doi: [10.1186/s12912-022-01009-7](https://doi.org/10.1186/s12912-022-01009-7). Available from: <https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-022-01009-7>
18. Salsman JM, Grunberg SM, Beuamont JL, Rogers M, Paul D, Clayman ML, Cella D. Communicating About Chemotherapy-Induced Nausea and Vomiting: A Comparison of Patient and Provider Perspectives. *J Natl Compr Canc Netw*. 2012;10(2):149-57. doi: [10.6004/jnccn.2012.0018](https://doi.org/10.6004/jnccn.2012.0018). Available from: <https://jnccn.org/view/journals/jnccn/10/2/article-p149.xml>
19. Kaupp K, Scott S, Minard LV, Lambourne T. Optimizing patient education of oncology medications: A quantitative analysis of the patient perspective. *J Oncol Pharm Pract*. 2019;25(6):1445-55. doi: [10.1177/1078155219843675](https://doi.org/10.1177/1078155219843675). Available from: <https://journals.sagepub.com/doi/10.1177/1078155219843675>
20. Rha SY, Song SK, Lee CE, Park Y, Lee J. Gaps exist between patients' experience and clinicians' awareness of symptoms after chemotherapy: CINV and accompanying symptoms. *Support Care Cancer*. 2016;24(11):4559-66. doi: [10.1007/s00520-016-3295-y](https://doi.org/10.1007/s00520-016-3295-y). Available from: <https://link.springer.com/article/10.1007/s00520-016-3295-y>
21. Lambourne T, Minard LV, Deal H, Pitman J, Rolle M, Saulnier D, Houlihan J. Optimizing Patient Education of Oncology Medications: A Patient Perspective. *J Cancer Educ*. 2019;34(5):1024-30. doi: [10.1007/s13187-018-1406-9](https://doi.org/10.1007/s13187-018-1406-9). Available from: <https://link.springer.com/article/10.1007/s13187-018-1406-9>
22. Lorusso V. Management of chemotherapy-induced nausea and vomiting by risk profile: Role of netupitant/palonosetron. *Ther Clin Risk Manag*. 2016;12:917-25. doi: [10.2147/TCRM.S89215](https://doi.org/10.2147/TCRM.S89215). Available from: <https://www.dovepress.com/article/download/27310>
23. Crespo A, Tyszka M. Evaluating the patient-perceived impact of clinical pharmacy services and proactive follow-up care in an ambulatory chemotherapy unit. *J Oncol Pharm Pract*. 2017;23(4):243-8. doi: [10.1177/1078155216634180](https://doi.org/10.1177/1078155216634180). Available from: <https://journals.sagepub.com/doi/10.1177/1078155216634180>
24. Carnio S, Galetta D, Scotti V, Cortinovis DL, Antonuzzo A, Pisconti S, Rossi A, Martelli O, Cecere FL, Lunghi A, Del Conte A, Montagna ES, Topulli J, Pelizzoni D, Rapetti SG, Gianetta M, Pacchiana MV, Pegoraro V, Cataldo N, Bria E, Novello S. Chemotherapy-induced nausea and vomiting (CINV) in patients with advanced lung cancer during the first-line treatment: assessment by physicians, nurses, and patients from an Italian multicenter survey. *Support Care Cancer*. 2018;26(6):1841-9. doi: [10.1007/s00520-017-4004-1](https://doi.org/10.1007/s00520-017-4004-1). Available from: <https://link.springer.com/article/10.1007/s00520-017-4004-1>
25. Wang Y, Wu H, Xu F. Impact of Clinical Pharmacy Services on KAP and QOL in Cancer Patients: A Single-Center Experience. *Biomed Res Int*. 2015;2015:502431. doi: [10.1155/2015/502431](https://doi.org/10.1155/2015/502431). Available from: <https://onlinelibrary.wiley.com/doi/10.1155/2015/502431>