



Nurses' Knowledge, Practice Regarding Chemotherapy Induced Gastrointestinal Complications

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Received: 28 October 2024, **Accepted:** 17 November 2024, **Published:** 20 November 2024

Abstract:

Background: Chemotherapy is a corner stone of cancer treatment for many tumor entities; however it is associated with many side effects. Key roles of nurses in cancer chemotherapy management are assessing the patient for adverse events, and provide support by addressing the patient's concerns. In a collaborative practice, the oncology nurse is also directly responsible for the education of the patient in symptom management, especially during chemotherapy. It is imperative for nurse to be knowledgeable regarding the current regimens, the associated toxicity profiles, tools used in symptom management, maximally enhance the patient's safety while receiving chemotherapy, and improve the patient's overall quality of life. **Aim:** Evaluate nurses' performance regarding gastrointestinal complications due to chemotherapy and patients' outcomes. **Aim:** Evaluate nurses' knowledge and practice regarding chemotherapy induced gastrointestinal complications. **Design:** A descriptive design was utilized. **Setting:** AL-Ahrar Oncology Center at AL- Ahrar Hospital, Zagazig, Sharquia. **Subjects:** Available nurses (30) working in the mentioned setting. **Tools:** Two tools **Tool I:** A Self- administrated Questionnaire for Nurses, **Tool II:** Observational Checklist for Nurse's Practice regarding GIT Complications due to chemotherapy, **Results:** The results showed that, about more than half of the studied nurses were less than 30 years, female, married, and had technical institute. More than half of the studied nurses had satisfactory total knowledge. More than half had satisfactory total practice regarding gastrointestinal complications of chemotherapy. There was statistically significant positive correlation between nurses' total knowledge and total practice. **Conclusion:** Studied nurses had satisfactory level of knowledge, practice about chemotherapy induced gastrointestinal complications. **Recommendation:** provide training and educational program for nurses about gastrointestinal complications of chemotherapy to improve nurses' knowledge, practice.

Keywords: Chemotherapy, Induced, Gastrointestinal Complications.



Introduction

Chemotherapy serves as a cornerstone of cancer therapy, with established benefits in tumor control, survival prolongation, and symptom management (**Peng et al., 2026**). Chemotherapy is the use of pharmacologic or natural agents that inhibit the development of invasive cancer cells either by blocking the DNA damage that initiates carcinogenesis or by arresting or reversing the progression of premalignant cells in which such damage has already occurred (**Dhara et al., 2022**). Chemotherapeutic agents are commonly associated with side effects. Usually, the side effects of chemotherapy are a reflection of their mechanism of action. Most chemotherapy drugs show activity in rapidly multiplying cells, so they tend to affect rapidly multiplying cells, e.g., bone marrow, GI tract, hair follicles. Common toxicities associated with GIT such include nausea, vomiting, mucositis, diarrhea, constipation (**Ali et al., 2022**). Gastrointestinal syndrome (GI syndrome) is a cluster of symptoms relating to toxicity of chemotherapy. It can occur with many different chemotherapy regimens. Symptoms of GI syndrome including severe diarrhea, nausea, vomiting, anorexia and abdominal cramping are often accompanied with dehydration, neutropenia, fever and electrolyte imbalances (**Akbarali et al., 2022**). Nurses require knowledge about chemotherapy such as definition, goals, types, route of administration, and gastrointestinal complications such as etiology, types, preparation of chemotherapy, safety precautions, and spillage of chemotherapy, nursing preventive measures, and nursing care. Staff nurses should know how to prevent the patient from complications. One of the roles of nurse is to prevent the patient from complications (**Abd El Kareem et al., 2020**). Nursing practice for patients with gastrointestinal

complications is a complex and multifaceted undertaking that requires a comprehensive and team-based approach. By promoting ongoing education, collaboration, and quality improvement, nursing teams can help to achieve better outcomes for patients with gastrointestinal complications and improve their overall quality of life (**Dai & Chen, 2023**).

Significance of the study

Clinically, 70%-80% of tumor patients need chemotherapy, and up to 90% of chemotherapy drugs can destroy tumor cells and interfere with normal tissue cells, resulting in a series of side effects such as digestive tract toxicity (**Du et al., 2023**). Chemotherapy can produce many of clinically relevant gastrointestinal (GI) side effects, among others, nausea and vomiting, mucositis, constipation, and diarrhea.

Aim of study: was to evaluate nurses' knowledge and practice regarding chemotherapy induced gastrointestinal complications.

Research question

- What is the level of nurses' knowledge regarding gastrointestinal complication due to chemotherapy?
- What is the level of nurses' practice regarding gastrointestinal complications due to chemotherapy?

Methods

Research design

A descriptive design was utilized in the current study.

Study setting

The current study was conducted in AL-Ahrar Oncology Center at AL-Ahrar



Hospital, Zagazig, Al Sharqia Governorate, Egypt.

Study participants

A convenience sample of available nurses (30) who working in AL- Ahrar Oncology Center, provides direct patient care, had experience in dealing with chemotherapy at least one year and accepts to participate in the study. **Tools of data collection:**

Two tools were used to collect data include:

First tool: A Self-administrated Questionnaire for Nurses: This tool was developed by the researcher in Arabic language form to avoid misunderstanding and composed of two parts: **Part 1:** concerning with demographic characteristics of the studied nurses such as age, sex, residence, marital status, qualification, and years of experience in oncology center. **Part 2:** concerning with nurses' level of knowledge regarding gastrointestinal complications due to chemotherapy. It classified to 2 main sections: **Section A:** - including questions about nurses' knowledge regarding chemotherapy such as definition, goals, types, route of administration, and complications. **Section B:** - including questions about nurses' knowledge regarding gastrointestinal complications such as etiology, types, preparation of chemotherapy, safety precautions, spillage of chemotherapy, nursing preventive measures, and nursing care.

Second tool: Observational checklists for nurses' practice: It was used to assess nurses' practice regarding gastrointestinal complications due to chemotherapy. It includes physical assessment, nutritional assessment, oral care, relaxation techniques, nursing care for nausea and vomiting, nursing care for diarrhea, nursing care for constipation, and nursing care for stomatitis.

Tool validity and reliability

The tools validity was tested by five jury of expertise from professor nursing, Zagazig University to determine relevance, clarity, completeness and comprehensiveness of the tools.

Reliability was assessed using Cronbach's alpha coefficient, which demonstrated reliability for total nurse knowledge is 0.661 and total nurse practice is 0.735.

Field work

Field work of the present study was executed in 12 month from February, 2025 to the end of January, 2026 as the following 2 months prepare literature review, 2 months prepare the tools, 3 months collect the sample, 2 months statistics and 3 months write the tables and discussion and recommendations. Before collect the sample, meetings head units to clarify the objective of the study. Also meetings all of the study nurses were given the same instruction, the researcher met personally with each of them and explaining the purpose of the study and how filled the questionnaire. Distribution of the questionnaire was done every day at the end of morning shift for nurses working at morning shift and gave the afternoon nurses before starting their work. The researcher gave each nurse individually to fulfill the questionnaire; the time required for completion of the questionnaire was ranged from 20-30 minutes. Observation was done continuously, every day at morning and afternoon shift during the previous procedures before filling the questionnaire. An observational checklist takes 30 minutes for each nurse.

Pilot study

A pilot study was performed on 10% of sample size to test clarity, comprehensiveness and estimation of time needed to fill out the questionnaire sheet.



Then the tools were modified according to the results of pilot study. Simple modifications were done based on pilot results as rephrasing and rearrangement. The pilot study was excluded from the study sample.

Ethical consideration

The study proposal received ethical clearance from the postgraduate and research ethics committee (REC) at the Faculty of Nursing, Zagazig University, under approval code M.D.ZU.NUR/262/1/3/2025. Prior to initiating the study, formal authorization was obtained through an official letter issued by the dean of the Faculty of Nursing to the director of El- Ahrar Hospital Subsequently, the hospital director and nursing director granted permission to proceed with the research.

Statistical design

All data were collected, tabulated and statistically analyzed using SPSS 25.0 for windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed as the mean $\pm$ SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi-square test when appropriate. Correlation coefficient test was calculated to assess relationship between various study variables, values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. P-value < 0.05 was considered statistically significant (S), and p-value ≥ 0.05 was considered statistically insignificant (NS).

Results

Table 1 illustrates that; 56.7% of the studied nurses their age was less than 30 years with mean age 29.40 ± 5.34 , 100.0%

were female, 80.0 % had technical institute of nursing, 93.3% married, and 76.7% had less than 5 year of experience with mean 3.97 ± 2.17 . In addition, 100 % are reported that there are hadn't policy, booklet and training courses about chemotherapy. Furthermore, 43.3% of studied nurse reported that lake of adequate training, two fifth reported that lake of medical equipment is challenge faced when dealing with patients received chemotherapy

Table2 Confirms that; 100% of the studied nurses had satisfactory practice level regarding vital signs measuring and physical examination. 70.0% had satisfactory practice level regarding nursing care of nausea and vomiting. On the other hand, less than half of studied nurses had satisfactory practice regarding relaxation technique, oral care, and nursing care of diarrhea (43.3, 46.7, 43.3%) respectively.

Table 3: There are statistically significant positive correlations coefficient between the studied nurses total knowledge and total practice ($r=0.302$).

Figure 1: portrays that; 56.7% of studied nurses had satisfactory total knowledge level about chemotherapy induced gastrointestinal complications. While 43.3% had unsatisfactory knowledge level.

Figure 2: Displays that 60.0% of the studied nurses had satisfactory total practice level. While, 40.0% had unsatisfactory total practice level regarding care provided for gastrointestinal complication.

Discussion

Regarding demographic characteristics of studied nurses: The study sample was 30 nurses (all available nurses who provided direct patient care and working in El- Ahrar oncology center at El-Ahrar Hospital). The present study clarified that more than half of the studied nurses were less than 30 years. All



of them were female, most of them were married, and majority of them had technical institute with less than five years of experience.

Regarding to age, the results of the present study agree with **Ahmed et al. (2026)**. who reported that about more than half of the studied nurses had age less than thirty years. While disagree with the study done by **Mamdouh et al, (2022)** reported that less than half of the studied nurses were in the age group from 20 to less than 30 years old. Regarding sex, the results of current study agrees with previous studies conducted by **El-Fadl, (2020)** revealed that all of studied nurses were females, and the majority of them were married. While the result disagree with study **Albani, et al, (2023)** found that socio-demographic profile of nurses indicate that majority of the participants were male. Related to level of education, the results of current study were in the same line with **El-Fadl, (2020)** who reported that two-thirds of the studied nurse had the technical institute of nursing. On the other hand **Watheeq & Al-ashour, (2022)** found that more than half of nurses were bachelors.

Regarding the years of experience, the results of present study were consistent with **Hosen et al, (2019)** mentioned less than two-thirds of nurses those working in oncology units have less than five years of experience. While, **Hamdy et al, (2022)** showed that more than third of studied nurses had experience more than five years in oncology field. The results of current study reported that all studied nurses had no training about chemotherapy. The present study reported that lack of medical equipment and lack of adequate training are challenges that studied nurse faced when dealing with patients. This result agrees with **Ahmed et al. (2026)** in her study showed that most of the studied nurses didn't attend any training courses about chemotherapy. More ever, **El-Fadl, (2020)** who revealed that three-quarters of nurses did

not attend any training courses about chemotherapy. On the other hand results by **Albani et al., (2023)** founded that more than half of nurses had received training on chemotherapy. Also, this result supported by study conducted by **Mousa et al, (2021)** reported that the vast majority of nurses working in oncology wards had previously got training courses.

The present study demonstrated that nurses had a high level of satisfactory practice in basic physical assessment parameters, particularly vital signs and general physical examination measures. In addition, nurses assessed patients' height and weight, indicating strong adherence to routine and essential assessment procedures. The same finding founded by **Mamdouh et al, (2022)** who found that two third of nurses had satisfactory practice level regarding physical assessment, particularly determine anthropometric measurements, examine all systems for chemotherapy side effects.

The present study presented that nearly all studied nurses performed relaxation techniques such as sleeping on the back or sitting on a chair. This may be attributed to the simplicity of these techniques and their frequent use to reduce anxiety, fatigue, and discomfort among patients receiving chemotherapy. This finding was in contrast with **Ramadan et al, (2023)** reported that majority of studied sample had unsatisfactory score regarding relaxation techniques. Concerning oral care, the presented study showed more than two third of nurses' perform steps related to increasing fluid intake, adequate hydration is commonly emphasized in chemotherapy care to reduce oral dryness, mucositis, and discomfort, rinsed the oral mucosa, washed the mouth and teeth after meals and before bedtime, reflecting good adherence to basic oral hygiene measures. This finding was in accordance with **Abdelaziz, (2020)** reported that two third of the studied nurses perform

steps regarding oral care. On the other hand **Ramadan et al, (2023)** revealed that more than two thirds of nurses didn’t perform steps regarding oral care technique.

The current study revealed a statistically significant positive correlation between nurses’ total knowledge and total practice ($r = 0.302$, $P = 0.010$). This finding indicates that increasing nurses’ knowledge is associated with improvement in their clinical practices. Adequate knowledge enables nurses to perform clinical procedures more accurately, adhere to evidence-based guidelines, and provides safer patient care. These results agree with **Alshammari et al, (2021)** who reported that nurses with higher levels of knowledge demonstrated significantly better clinical practices and adherence to patient safety measures. In the other hand **Mamdouh et al, (2022)** revealed that no statistical significant differences were found between nurses’ practice mean scores and their knowledge levels.

Conclusion: Nurses had satisfactory level of knowledge, practice about gastrointestinal complications of chemotherapy.

Recommendation: Provide training and educational program for nurses about GIT complications of chemotherapy to improve nurses’ knowledge, practice.

Authors’ contributions

E.G suggested that research the research concept, drafted the proposal and interviewed the sample, collected and analyzed interpreted the data, and drafted the manuscript. The researcher idea was proposed by F.A, S.M, A.S Participated to the study by reviewing and assisting in developing the research methodology, analyzing and interpreting the data, and discussion. All authors have read and approved the final manuscript.

Acknowledgment

The researchers express their gratitude and best wish for a happy life to the nurses and

cancer survivors who participated in the study.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

Funding source

For the research, the author received no financial support authorship, publication of this article.And/or publication of this article.

Table 1: Frequency and Percentage Distribution of Demographic Characteristics to Studied Nurses (N=30)

Demographic characteristics	No.	%
Age		
<30	17	56.7
30- <40	10	33.3
40+	3	10.0
Min-Max	21-41	
Mean ±SD	29.40±5.34	
Sex		
Female	30	100.0
Qualification		
Technical Institute	24	80.0
Bachelor of nursing	6	20.0
Marital status		
Single	2	6.7
Married	28	93.3
Number of years of experience at the Oncology Center		
<5	23	76.7
5+	7	23.3
Min-Max	1-10	
Mean ±SD	3.97±2.17	
Have you received training courses about chemotherapy		
No	30	100.0
The hospital have a policy for dealing with chemotherapy		
No	30	100.0
There are booklet about chemotherapy		
No	30	100.0
Challenges you face when dealing with chemotherapy patients		
Lack of medical equipment	12	40.0
Lack of adequate training	13	43.0
Unclear treatment protocols	3	10.0
Unavailability of symptomatic medications	2	6.7



Table2: Frequency and Percentage Distribution of Studied Nurses Satisfactory Total Practice Level (N=30)

Practices	Total Satisfactory Practice	
	No	%
Vital signs measuring	30	100.0
System assessment	17	56.7
Physical examination	30	100.0
Nutrition conduction	20	66.7
Relaxation technique	13	43.3
Oral care	14	46.7
Nursing care to nausea/vomiting	21	70.0
Nursing care for diarrhea	13	43.3
Nursing care to constipation	16	53.3
Nursing care for stomatitis	15	50.0

Table3: Correlation Coefficient between Studied Nurses' Total Knowledge and Total Practice

		Total practice
Total knowledge	R	0.302
	P-value	0.010*
Total practice	R	
	P-value	

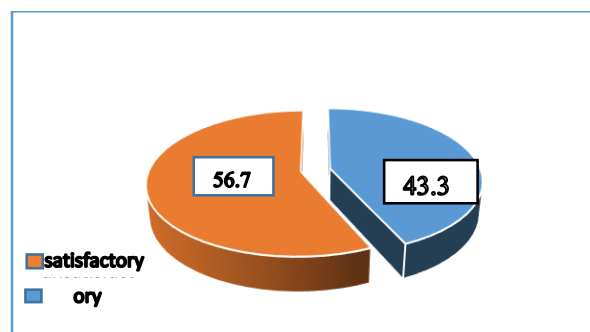


Figure 1: Percentage of Total Nurses' Knowledge Level about Chemotherapy Induced Gastrointestinal Complications.

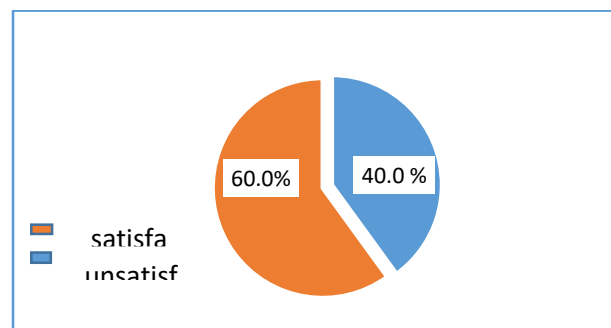


Figure 2: Percentage of Total Nurses' Practice Level Regarding Care for Gastrointestinal Complications

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