

Knowledge Regarding Self-Care Among the Patients Receiving Chemotherapy: A Cross-Sectional Study

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ABSTRACT

BACKGROUND: Cancer is one of the leading causes of morbidity and mortality worldwide (World Health Organization, 2018). Chemotherapy is one of the major treatment modalities used in the management of cancer. Although chemotherapy helps in destroying cancer cells, it is also associated with several side effects such as nausea, vomiting, fatigue, loss of appetite, hair loss, infection, mucositis, and anemia, which can affect the physical and psychological wellbeing of patients ("American cancer society," 2024).

METHODOLOGY: A quantitative research approach with descriptive cross-sectional research design was adopted for the study. The study was conducted in Ramaiah Cancer Unit at Ramaiah Hospitals, Bengaluru. A total of 120 patients receiving chemotherapy were selected using non-probability convenience sampling technique. Data were collected using a structured knowledge questionnaire regarding self-care among patients receiving chemotherapy. The collected data were analyzed using descriptive and inferential statistics.

RESULTS: The findings of the study revealed that 24 (20%) of cancer patients had adequate knowledge, 42 (35%) of cancer patients had moderate knowledge and 54 (45%) of cancer patients had inadequate knowledge regarding self-care. The study also revealed that age ($\chi^2 = 9.134$, $p = 0.010$) had a statistically significant association with the level of knowledge regarding self-care at the 0.05 level of significance. Other socio-demographic variables did not show a statistically significant association with knowledge regarding self-care, as their p-values were greater than 0.05.

CONCLUSION: The study concluded that the majority of the patients had inadequate knowledge regarding self-care among the patient's receiving chemotherapy. The findings emphasize that still there are certain gaps in areas of self-care management. Therefore, health education and continuous guidance by nurses are essential to improve patients' knowledge and promote effective self-care practices during chemotherapy treatment.

KEYWORDS: Knowledge, self-care, chemotherapy, cancer patients, chemotherapy side effects, patient education.

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1.

INTRODUCTION

Cancer is one of the most significant public health challenges worldwide and represents a leading cause of morbidity and mortality across all age groups. It is characterized by uncontrolled proliferation of abnormal cells with the ability to invade surrounding tissues and metastasize to distant organs. The global cancer burden continues to increase due to population growth, aging, lifestyle changes, environmental exposures, and improved diagnostic facilities. According to global estimates, approximately 18.1 million new cancer cases and 9.6 million cancer-related deaths were reported in 2018, and it is projected that the number of new cancer cases will exceed 26 million annually by 2030 (World Health Organization, 2018). More than 60–70% of cancer deaths occur in low- and middle-income countries, highlighting the disparities in access to early diagnosis, treatment, and supportive care services (Paul and Veigas, n.d., 2015). In India, cancer incidence is rising steadily, with cancers of the breast, cervix, lung, oral cavity, and colorectum being the most commonly

reported. National statistics indicate that India reports over 1.3 million new cancer cases annually, with mortality rates remaining high due to late diagnosis and limited access to comprehensive cancer care (Paul and Veigas, n.d., 2015). Cancer predominantly affects adults in the 35–64-year age group, resulting in substantial socioeconomic consequences for individuals, families, and the healthcare system. Beyond physical suffering, cancer diagnosis is associated with profound psychological distress, fear of death, social isolation, and financial burden, emphasizing the need for holistic and continuous care throughout the disease trajectory. Chemotherapy remains one of the cornerstone treatment modalities for cancer and is widely used either alone or in combination with surgery, radiotherapy, targeted therapy, or immunotherapy. It may be administered with curative, adjuvant, neoadjuvant, or palliative intent depending on the type and stage of cancer. It is estimated that over 50–60% of cancer patients receive chemotherapy at some point during their treatment. As a result, chemotherapy is associated with a wide range of

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side effects, including nausea, vomiting, fatigue, alopecia, mucositis, anemia, thrombocytopenia, neutropenia, diarrhea, constipation, and increased susceptibility to infections. Research indicates that nearly all patients receiving chemotherapy experience at least one adverse effect, and many experiences multiple symptoms simultaneously. Some side effects occur immediately after drug administration, while others such as myelosuppression may develop 1–4 weeks after treatment, placing patients at increased risk for life-threatening complications. These side effects significantly affect patients' physical functioning, emotional well-being, treatment adherence, and overall quality of life (Ali et al., 2022).

2. SUBJECTS AND METHODS

2.1. STUDY DESIGN

The selection of the research design depends on the purpose of the study, research approach and variables to be studied. The research design selected for the study was Descriptive cross-sectional research design.

2.2. SAMPLE AND SAMPLING METHOD

The sample consisted of 120 cancer patients undergoing chemotherapy in Ramaiah cancer unit at Ramaiah hospitals, Bengaluru. Non-probability convenient sampling technique was used to select the samples for the study.

SAMPLE SIZE DETERMINATION:

From the literature review it has been reported that 18% of the study subject had poor knowledge on self-care in the patients undergoing chemotherapy (Mohammad and Ohmaed, n.d., 2023)

In present study expecting similar result with 95% confidence level and 7% absolute precision study require minimum of 116 samples. That was rounded off up to 120 samples.

Study formula:

$$n = \frac{(z)^2 \times p \times q}{d^2}$$

Interpretation	Score	Percentage
Adequate knowledge	38-47	80-100%
Moderate knowledge	28-37	60-79%
Inadequate knowledge	0-27	<60%

2.4. ETHICAL CONSIDERATION

Ethical clearance was obtained from the M.S. Ramaiah University Ethics Committee for human trials on December 2025 (Reference no.: EC-25/ 145-PG-RINER)

2.5. ANALYTICAL METHODS

DESCRIPTIVE STATISTICS:

- Frequency distribution and percentage were used to describe the socio-demographic variables.
- Frequency distribution, percentage, mean and standard deviation was used to describe the level of knowledge regarding self-care among the patients receiving chemotherapy.

2.3. QUESTIONNAIRES

After an extensive review of the literature, discussion with experts, and investigator's personal and professional experience the tool was developed and it consist of two parts:

Section A:

Sociodemographic data: The first part of the tool consists of demographic variables such as age, gender, educational status, occupation, economic status, marital status, area of residence, type of family, habits, received information, type of cancer, duration since diagnosis, number of chemotherapy cycles completed.

Section B:

The structured knowledge questionnaire regarding self-care has few Components that are:

- General knowledge of Chemotherapy
- Awareness of common chemotherapy side effects
- Recognition of serious or red flag symptoms
- Management and self-care strategies
- Medication knowledge
- Infection prevention practices
- Lifestyle and supportive care
- Knowledge of follow-up and communication
- Safe handling and home precautions
- Adherence to treatment

SCORING AND INTERPRETATION:

The scoring key was prepared as follows:

- For each correct answer, a score of 1 was given
 - For each incorrect answer, a score of 0 was given.
- A total of 47 questions and total score was 47. The calculated score was then converted to a percentage.

Interpretation:

Based on Bloom's cut-off point, knowledge score was categorized as

- Adequate Knowledge: 80–100%
- Moderate Knowledge: 60–79%
- Inadequate Knowledge: <60%

INFERENTIAL STATISTICS:

- The Chi-square test and Fisher's exact test was used to find the association between self-care among the patients receiving chemotherapy and selected socio-demographic variables.

3. RESULTS

SECTION A: Frequency and percentage distribution of socio-demographic variables of the patients receiving chemotherapy.

SECTION A. 1.: Frequency and percentage distribution of knowledge regarding self-care among the patients receiving chemotherapy.

SECTION A. 2.: Mean and Standard Deviation of

knowledge regarding self-care

SECTION B: Association between the knowledge regarding self-care among the patients receiving chemotherapy and selected socio-demographic variables.

**SECTION-A:
SOCIO-DEMOGRAPHIC VARIABLES OF THE
PATIENTS RECEIVING CHEMOTHERAPY**

Table:1: Frequency and percentage distribution of subjects with Socio-demographic variables

n=120			
SL.NO.	SOCIO-DEMOGRAPHIC DATA	FREQUENCY	PERCENTAGE%
1.	Age in years		
	18-29 years	9	7.4
	30-39 years	29	24.2
	40-49 years	36	30.0
	50-59 years	23	19.2
	60 years and above	23	19.2
2.	Gender		
	Male	55	45.8
	Female	65	54.2
3.	Educational status		
	No Formal Education	27	22.5
	Primary Education	22	18.3
	Secondary Education	24	20.0
	Higher Secondary Education	16	13.3
	Diploma	26	21.7
	Graduate	4	3.3
	Any other	1	0.9
4.	Occupation		
	Government	4	3.3
	Private	37	30.8
	Business	17	14.2
	Agriculture	34	28.3
	Not employed	23	19.2
	Specify	5	4.2
5.	Economic status		
	<Rs 10000	25	20.8
	Rs 10001-Rs 35000	33	27.5
	Rs 35001-Rs 50000	47	39.2
	Rs 50001 and above	15	12.5
6.	Marital Status		
	Single	19	15.8
	Married	75	62.5
	Divorced	9	7.5
	Widowed	12	10.0
	Separated	5	4.2
7.	Area of Residence		
	Urban	49	40.8
	Rural	71	59.2
8.	Type of Family		
	Nuclear	63	52.5
	Joint	57	47.5
9.	Habits		
	Smoking	31	25.8
	Alcoholism	13	10.8
	Pan chewing	23	19.2

	None of the above	53	44.2
10.	Information received		
	Health professionals	38	31.7
	Mass media	9	7.5
	Friends and relatives	6	5.0
	Peer patients	3	2.5
	No	64	53.3
11.	Type of cancer		
	Breast cancer	35	29.2
	Lung cancer	24	20.0
	Lymphoma	18	15.0
	Leukemia	9	7.5
	Any other	34	28.3
12.	Duration since diagnosis		
	<6 months	76	63.3
	6-12 months	28	23.3
	1-2 years	12	10.0
	Over 2 years	4	3.4
13.	Number of chemotherapy cycle completed		
	None	3	2.5
	1-3	65	54.2
	4-6	40	33.3
	More than 6	12	10.0

The findings from Table no.1 shows that the majority of patients receiving chemotherapy were in the age group of 40–49 years (30%), followed by those aged 30–39 years (24.2%). Females (54.2%) were slightly more in number than males (45.8%). Regarding educational status, 22.5% of the patients had no formal education, while the remaining patients had varying levels of education ranging from primary to graduate level.

In terms of occupation, the highest proportion of patients were engaged in private employment (30.8%) and agriculture (28.3%), while 19.2% were not employed. Economically, the largest group of patients (39.2%) had a monthly income between Rs. 35,001 and Rs. 50,000. The majority of patients were married (62.5%) and more

patients resided in rural areas (59.2%) than urban areas. Slightly more than half of the patients (52.5%) belonged to nuclear families.

With regard to habits, 44.2% of the patients reported no habits, while others reported smoking, pan chewing, or alcohol consumption. More than half of the patients (53.3%) had not received any information regarding the management of side effects, and among those who received information, health professionals were the main source. Breast cancer was the most frequently reported type of cancer (29.2%). A majority of patients (63.3%) had been diagnosed within the past six months, and more than half of the patients (54.2%) had completed 1–3 cycles of chemotherapy.

SECTION-A.1

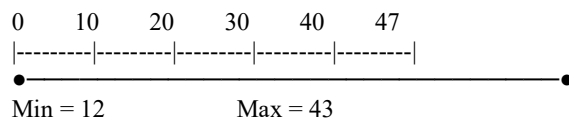
Table 2: Frequency and percentage distribution of knowledge regarding self-care among the patients receiving chemotherapy n=120

SL.NO.	KNOWLEDGE REGARDING SELF-CARE	FREQUENCY	PERCENTAGE
1.	Adequate knowledge	24	20%
2.	Moderate knowledge	42	35%
3.	Inadequate knowledge	54	45%

Table no.2 depicts that 45% of the patients had inadequate knowledge, 35% had moderate knowledge, and only 20% demonstrated adequate knowledge regarding self-care.

SECTION-A.2:

Table 3: Mean and Standard Deviation of knowledge regarding self-care



Mean = 28.23

SD = ± 8.038

Table no.3 presents the overall knowledge regarding self-care score ranged from a minimum of 12 to a maximum of 43. The mean knowledge score was 28.23 with a standard deviation of ± 8.038 , indicating a moderate level of knowledge among the study participants.

SECTION B:

Table 4: Association between the knowledge regarding self-care among the patients receiving chemotherapy and selected socio-demographic variables. n=120

Sl. No.	Socio-Demographic Data	Knowledge			Chi square value χ^2 /Fisher Exact value	P Value
		Adequate Knowledge	Moderate Knowledge	Inadequate Knowledge		
1.	Age in year					
a.	18-29 years	2	3	4	9.134 df=8	0.010 S*
b.	30-39 years	8	8	13		
c.	40-49 years	4	9	23		
d.	50-59 years	7	11	5		
e.	60 years and above	3	11	9		
2.	Gender					
a.	Male	12	17	26	0.714	0.645 NS
b.	Female	12	25	28		
3.	Educational status					
a.	No formal education	2	13	12	0.200 df=12	0.905 NS
b.	Primary education	5	7	10		
c.	Secondary education	5	9	10		
d.	Higher secondary education	4	5	7		
e.	Diploma	7	7	12		
f.	Graduate	1	0	3		
g.	Post graduate	0	1	0		
4.	Occupation					
a.	Government	1	0	3	1.828 df=10	0.401 NS
b.	Private	8	13	16		
c.	Business	3	5	9		
d.	Agriculture	10	12	12		
e.	Not employed	1	10	12		
f.	Any other	1	2	2		
5.	Economic status					
a.	<Rs.10000	3	13	9	0.717	0.686 NS
b.	Rs10001-Rs35000	6	11	16		
c.	Rs35001-Rs50000	12	16	19		

Knowledge Regarding Self-Care Among Patients Receiving Chemotherapy: A Cross-Sectional Study

d.	Rs50001 and above	3	2	10		
6.	Marital status					
a.	Single	5	5	9	1.273 df=8	0.529 NS
b.	Married	15	29	31		
c.	Divorced	2	2	5		
d.	Widowed	1	5	6		
e.	Separated	1	1	3		
7.	Area of residence					
a.	Urban	9	14	26	0.191	0.140 NS
b.	Rural	15	28	28		
8.	Type of family					
a.	Nuclear	13	22	28	1.000	0.898 NS
b.	Joint	11	20	26		
9.	Habits					
a.	Smoking	9	12	10	0.583	0.554 NS
b.	Alcoholism	2	3	8		
c.	Pan chewing	5	7	11		
d.	None of the above	8	20	25		
10.	Received any information regarding management of side effects					
a.	Health professionals	8	15	15	2.572 df=8	0.276 NS
b.	Mass media	1	4	4		
c.	Friends and relatives	2	3	1		
d.	Peer patients	0	2	1		
e.	No	13	18	33		
11.	Type of cancer					
a.	Breast cancer	5	11	19	0.228	0.190 NS
b.	Lung cancer	2	8	14		
c.	Lymphoma	8	3	7		
d.	Leukemia	3	3	3		
e.	Any other	6	17	11		
12.	Duration since diagnosis					
a.	<6 months	16	26	34	0.596	0.517 NS
b.	6-12 months	6	8	14		
c.	1-2 years	2	5	5		
d.	Over 2 years	0	3	1		
13.	Number of chemotherapy cycles completed					
a.	None	0	1	2	0.360	0.336 NS
b.	1-3	16	23	26		
c.	4-6	8	12	20		
d.	More than 6	0	6	6		

S* = Significant at $p < 0.05$, NS = non-significant, df = degree of freedom

Table no.4 depicts the association between knowledge regarding self-care among patients receiving

chemotherapy and selected socio-demographic variables. The findings show that age ($\chi^2 = 9.134$, $p = 0.010$) had a statistically significant association with the level of knowledge regarding self-care at the 0.05 level of significance.

Other socio-demographic variables such as gender, educational status, occupation, economic status, marital status, area of residence, type of family, habits, receipt of information, type of cancer, duration since diagnosis, and number of chemotherapy cycles completed did not show a statistically significant association with knowledge regarding self-care, as their p-values were greater than 0.05.

Overall, the table indicates that knowledge regarding self-care among patients receiving chemotherapy was significantly influenced by age, while the remaining socio-demographic variables did not have a significant impact.

4. DISCUSSION

The present study was conducted to assess the knowledge regarding self-care among patients receiving chemotherapy in the Ramaiah Cancer Unit. Chemotherapy is associated with various physical and psychological side effects, and adequate knowledge regarding self-care plays an important role in preventing complications, improving treatment adherence, reducing hospital visits, and enhancing the quality of life of patients. The study also aimed to assess the knowledge related to self-care and to determine the association between knowledge regarding self-care and selected socio-demographic variables among patients receiving chemotherapy. The socio-demographic findings of the present study revealed that the majority of the participants (30%) belonged to the age group of 40–49 years, and more than half of the participants were females (54.2%). The majority of the subjects were married (62.5%) and resided in rural areas (59.2%). Regarding educational status, 22.5% of the participants had no formal education, while only a small proportion were graduates. Most participants were engaged in private employment and agriculture. More than half of the participants (53.3%) had not received any information regarding management of chemotherapy side effects. These findings are supported by a study conducted by Khan et al (Richardson and Ream, 1997), which reported that most chemotherapy patients belonged to the middle-age group, were female, and had limited educational background, which influenced their understanding regarding self-care practices. Similarly, a study by Kavitha et al. (Magalhães et al., 2020) revealed that many patients receiving chemotherapy lacked prior education regarding side-effect management and home care practices. The findings of the present study revealed that among 120 patients receiving chemotherapy, 45% had inadequate knowledge regarding self-care, 35% had moderate knowledge, and only 20% had adequate knowledge. The mean knowledge score was 28.23 ± 8.038 , indicating an overall moderate level of knowledge with a predominance of inadequate knowledge among participants. Similar findings were reported by Sajeev et al. (Urtekin and Eroglu, 2024), who

found that a majority of chemotherapy patients had inadequate knowledge regarding nutrition, infection prevention, management of side effects, medication adherence, and home precautions during chemotherapy. Likewise, Sharma et al. (Arunachalam et al., 2021) reported that patients undergoing chemotherapy demonstrated poor understanding regarding recognition of red-flag symptoms, safe handling precautions, and follow-up care. The study emphasized the importance of structured patient education programmes to improve self-care practices among cancer patients. The inadequate level of knowledge observed in the present study may be due to limited educational exposure, lack of counselling regarding chemotherapy side effects, low literacy level among participants, and inadequate access to health information. In the present study, more than half of the participants had not received any prior information regarding management of chemotherapy side effects, which may have contributed to poor self-care knowledge. However, studies conducted among patients who received regular counselling and educational support from healthcare professionals demonstrated comparatively higher self-care knowledge scores. A study by Patel and Rao (Williams et al., 2006) found that educational interventions significantly improved patients' understanding regarding chemotherapy precautions, dietary management, symptom monitoring, and treatment adherence.

5. CONCLUSION

The findings of the study revealed that 45% of the patients had inadequate knowledge, 35% of the patients had moderate level of knowledge and only 20% of the patients demonstrated adequate knowledge regarding self-care. The overall knowledge regarding self-care score ranged from a minimum of 12 to a maximum of 43. The mean knowledge score was 28.23 with a standard deviation of ± 8.038 , indicating a moderate level of knowledge among the study participants. However, the findings shows that age ($\chi^2 = 9.134$, $p = 0.010$) had a statistically significant association with the level of knowledge regarding self-care at the 0.05 level of significance. Other socio-demographic variables such as gender, educational status, occupation, economic status, marital status, area of residence, type of family, habits, receipt of information, type of cancer, duration since diagnosis, and number of chemotherapy cycles completed did not show a statistically significant association with knowledge regarding self-care, as their p-values were greater than 0.05. Overall, the table indicates that knowledge regarding self-care among patients receiving chemotherapy was significantly influenced by age, while the remaining socio-demographic variables did not have a significant impact.

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