Assessment of Cancer Chemotherapy Needs in Patients Attending Tertiary Care Cancer Center, q: A Cross-Sectional Study

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Abstract

Introduction Globally, 19.3 million new cancer cases were diagnosed in 2020, with over 10.0 million cancer deaths. Patients with cancer often face various long-term physical, social, financial, psychological, and existential challenges, complicating their survivorship.

Objectives This study aimed to evaluate the different needs of patients undergoing chemotherapy at a tertiary care cancer center.

Materials and Methods Data were collected from a tertiary care cancer center using purposive sampling. A total of 101 samples were collected over a 2-month period.

Results The majority of participants were female (61.4%), with 38.6% being male. Most participants were in the third stage of cancer (57.4%), with 42.6% in the fourth stage. Localized metastasis was observed in 83.2% of participants. The most common symptoms were lack of appetite (59.4%) and nausea/vomiting (54.5%). Most participants rated the care provided by nurses during chemotherapy as good (86.1%). The majority had moderate needs (67.3%) during the treatment course.

Conclusion The study highlights significant needs in the physical and psychological domains among patients undergoing chemotherapy.

Keywords
- cancer needs assessment
- chemotherapy
- physical needs
- psychological needs

Introduction

Cancer is a major disorder that causes millions of deaths worldwide. Cancer cells divide uncontrollably, leading to tumor growth and immune system dysfunction. Due to factors such as population ageing, tobacco use, radiation exposure, adopting a more sedentary lifestyle, and genetic predisposition, its incidence has increased in recent years.[1] Globally, 19.3 million new cancer cases have been diagnosed in 2020, with over 10.0 million cancer deaths.[2]

According to recently released cancer facts and figures reported by the International Agency for Research on Cancer, there has been an overall increase in the cancer burden in South Asia over the last decade. The region is now home to almost a quarter of new cancer cases globally and is also expected to have the highest growth rate among all other regions by 2030.[3] Cancer remains a largely dreaded illness and is usually associated with death, but this may not always be true. Although it is still one of the top three leading causes

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of death in India and several other developing countries, it can be managed if diagnosed early.[4]

The increase in cancer burden in India can be attributed to several factors, such as an ageing population, an unhealthy lifestyle, and an increase in obesity. While the proportion of people with cancers in older age groups is expected to increase, the proportion of people younger than 50 with cancer is also expected to increase. Certain risk factors for cancer, such as tobacco use, unhealthy diet, and alcohol consumption, are expected to increase, contributing to the country's increased cancer burden.[5]

As a result of the current advances in cancer treatment and the evolving landscape of clinical trials, more adults are surviving cancer and living longer than ever before. The most common cause of cancer death is lung cancer, with 1.8 million deaths predicted.[6]

Patients with cancer may experience varying degrees of long-term physical, social, financial, psychological, and existential distress, complicating their survivorship. Cancer survivors may experience physical and psychological symptoms beyond 10 years after treatment completion, even though some cancer-related concerns usually decrease over time. These symptoms may include fatigue, pain, and sleep difficulty.[7]

Despite providing chemotherapy, many patients experience various symptoms in the form of adverse effects, a major drawback of chemotherapy.[8] The physical domain describes the adverse effects of chemotherapy. Other unmet needs are also present during treatment, crucial for improving quality of life. Psychological factors also play a major role in quantifying the health-related quality of life in cancer patients who may experience different psychological disturbances during the treatment.[9]

In the context of increasing cancer burden and the significant impact of chemotherapy on patients' well-being and quality of life, it is essential to evaluate the specific needs of individuals undergoing this treatment. This study aimed to assess the needs of patients undergoing chemotherapy at a tertiary care cancer center. By understanding these needs, health care providers can address chemotherapy-related adverse effects and improve patient-centered care. The findings of this study will inform clinical practice, guide future research, and contribute to interventions that optimize the chemotherapy experience of patients. The main objectives of the study were to assess the needs of patients undergoing chemotherapy for cancer and determine factors associated with these needs.

Methodology

This study used a cross-sectional design to assess the different needs of cancer chemotherapy patients in a tertiary care cancer center. Data collection was conducted over 2 months using purposive sampling. The sample size of 101 participants was calculated based on a 2% prevalence of cancer in the Mysuru district, Karnataka, India, with an absolute precision of 2.8% and a confidence interval of 95%. Patients who provided informed consent and were free of psychological disorders were included. Those in terminal cancer stages were also included to capture a full range of experiences. Data was collected over 2 months through interviews using the validated Cancer Needs Assessment Tool-Chemotherapy (CNAT-CC) questionnaire.[10] The CNAT-CC has defined cutoff scores to classify needs as no need (0–25), moderate need (26–50), and high need (51–75).

The term "need" refers to cancer chemotherapy patients' perceived or identified requirements, demands, or necessities. These needs encompass various aspects such as physical symptoms, psychological well-being, information, support, and other elements essential for the comprehensive care and well-being of individuals receiving chemotherapy.

Data was entered in Microsoft Excel 2019 and analyzed using SPSS version 26 (licensed to the institution). Data analysis involved descriptive statistics in determining the frequency and percentage of different needs, and the chi-square test was used to explore the associations between dependent and independent variables. This study adhered to the ethical standards outlined in the 1964 Declaration of Helsinki and its later amendments. All procedures involving human participants were conducted following the guidelines of the Institutional Ethical Committee. The study was approved by the Institutional Ethical Committee (approval number: JSSMC/IEC/03072023). Informed consent was obtained from each participant before the commencement of the study.

Results

Data were collected from 101 participants. The majority of the participants in the current study were females (61.4%), and 38.6% were men. Most participants in the current study belonged to the Hindu religion (92.1%), while 4% belonged to Muslims and Christianity. From the current study participants, 54.5% belonged to rural areas, whereas 45.5% were from urban areas. Most participants in the current study were illiterate (33.7%), and 12.9% had a diploma or degree.

Most of the participants in the current study were semi-skilled (33.7%), and the least were unskilled (13.9%). The majority of the participants belonged to socioeconomic class II; that is, their income lies between 3,504 and 7,007 INR, and the least (5%) belonged to socioeconomic class V (1,050 INR and below). Most of the participants in the current study had joint families (49.5%), followed by nuclear families (42.6%) and three-generation families (7.9%).

Personal History and Disease Profiles

Most participants in the current study were in third stage of cancer (57.4%), and 42.6% were in fourth stage. Localized metastasis was observed in 83.2% ($n = 84$) of the participants. This indicates that cancer had metastasized locally from the original tumor to nearby lymph nodes or tissues for these patients but had not spread further to distant sites in the body. Regional tumors refer to cancer that has spread outside the original site to nearby organs, lymph nodes, or tissues. In this study, 4% ($n = 4$) of participants had regional tumors, meaning their cancer had spread regionally from the

primary site to adjacent organs or structures but not yet distantly throughout the body.

Comorbidities were absent in most participants ($n = 85$, 84.2%). Among those with comorbid conditions, diabetes was present in 3% ($n = 3$), diabetes with cardiovascular disease in 3% ($n = 3$), diabetes with hypertension in 5.9% ($n = 6$), and hypertension alone in 4% ($n = 4$). The majority of participants were undergoing chemotherapy (66.3%), followed by surgery + chemotherapy (14.9%), and triple therapy (surgery + chemotherapy + radiation) (12.9%). Note that 33.7 had lung cancer and 17.8% had rectal carcinoma, followed by breast carcinoma (12.9%), esophageal carcinoma (10.9%), and carcinoma of the stomach (8.9%). Acute leukemia was present in 5.9% of the participants (►**Table 1**).

Table 1 Clinical profile of the study participants

Personal history		
	n	%
Stage of cancer		
3	58	57.4
4	43	42.6
Type of tumor		
Regional	4	4.0
Localized metastasis	84	83.2
Metastasis	13	12.9
Comorbidities		
DM	3	3.0
DM and CVD	3	3.0
DM and HTN	6	5.9
HTN	4	4.0
Nil	85	84.2
Treatment		
Chemotherapy	67	66.3
Surgery + chemotherapy	15	14.9
Chemotherapy and radiation	6	5.9
Surgery + chemotherapy + radiation	13	12.9
Type of Cancer		
Acute leukemia	6	5.9
Carcinoma of breast	13	12.9
Carcinoma of colon	2	2.0
Carcinoma of esophagus	11	10.9
Carcinoma of leiomyosarcoma	3	3.0
Carcinoma of lung	34	33.7
Carcinoma of ovary	5	5.0
Carcinoma of rectum	18	17.8
Carcinoma of stomach	9	8.9

Abbreviations: CVD, cardiovascular disease; DM, diabetes mellitus; HTN, hypertension.
Note: Values are expressed as frequency and percentages.

Physical Needs

The majority of participants had a lack of appetite (59.4%). Nausea and vomiting sensations were present in 54.5% of participants. Forty-seven percent of the participants felt lethargic and fatigued during chemotherapy cycles.

Hair loss was seen in 60.4% of the participants during the treatment. Most participants (58.4%) had pains/aches during chemotherapy. Breathlessness was observed in a few participants (23.8%) (►**Fig. 1**).

Psychological Domain

Regarding psychological symptoms, 33.7% of the participants had anxiety and 9.9% felt depressed. Some participants stated they felt stressed during chemotherapy (19.8%) and 11.9% felt lonely.

Of the participants, 27.7% said they feared chemotherapy sessions and 12.9% said they feared hospitalization (►**Table 2**).

Hospital Care Domain

Most participants reported that their care needs were adequately met, with 86.1% ($n = 87$) stating that nurses provided good care during chemotherapy. Most participants (87.1%, $n = 88$) indicated their communication needs with doctors were well met. Prompt treatment for adverse reactions was received by most participants (88.1%, $n = 89$), meeting their needs for timely management of chemotherapy side effects. Most participants (92.1%, $n = 93$) reported that their needs for satisfactory care from treating doctors were fulfilled. The need for doctor availability in an emergency was met for 91.1% ($n = 92$) of participants. Most participants (89.1%, $n = 90$) had their needs met to be involved in treatment decisions, indicating their self-determined needs were satisfied. The hospital care domain reflects that most participants had their essential care and communication needs met during chemotherapy.

Information and Communication Domains

Moderate need (20.8%) was available for patients regarding the information provided regarding chemotherapy.

A moderate need (77.2%) was observed regarding information on adverse drug reactions and their occurrence during chemotherapy.

Information regarding emergencies (21.8) and self-management of drug reactions is in moderate need (24.8%).

Five percent of the participants felt they needed information on financial schemes by the government or private agencies. Participants stated that they had a moderate need for information on the current state of illness (15.8%), contact details of the treating physician (9.9%), and total expenditure on chemotherapy (26.7%).

Practical Needs Domain

Among the participants, 19.8% reported needing family support during chemotherapy. Most participants needed financial support (43.6%).

Note that 35.6% of the participants stated they needed transportation services to attend the chemotherapy sessions.

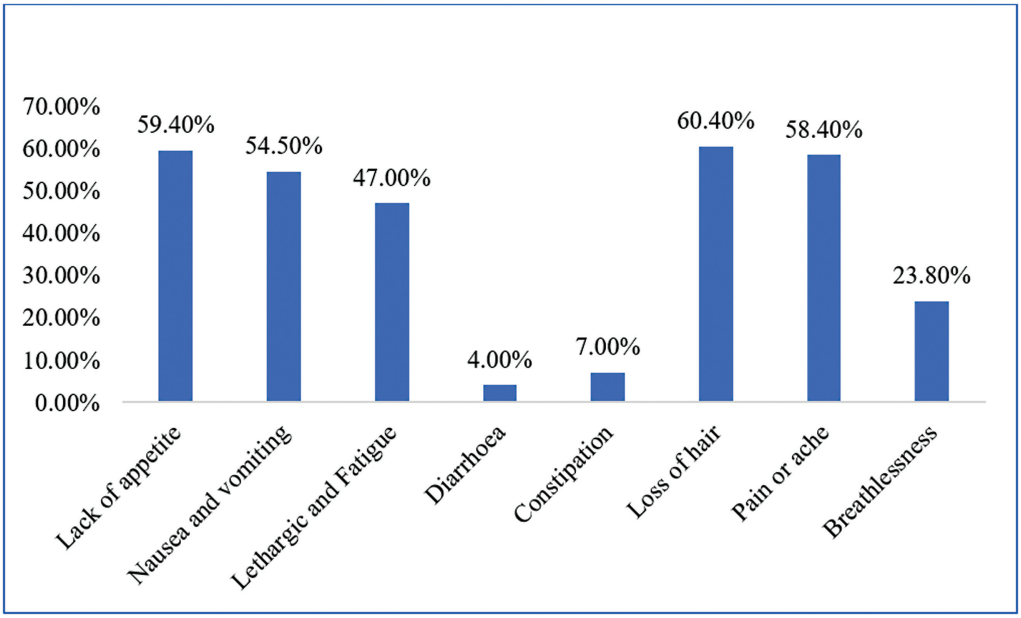

Fig. 1 Physical needs of the study participants.

Supportive care during chemotherapy was reported by 21.2% of the participants.

Total Needs of Patients

The overall score reflects participants' total needs assessed across all domains of the CNAT-CC questionnaire. The CNAT-CC has multiple items assessing needs in physical, psychological, hospital care, information, and practical domains.

Table 2 Psychological needs of the study participants

Psychological domain		Count *N*	Column %
Feeling of anxiety	No	67	66.3
	Yes	34	33.7
Feeling of depressed	No	91	90.1
	Yes	10	9.9
Feeling stressed during treatment	No	81	80.2
	Yes	20	19.8
Feeling loneliness	No	89	88.1
	Yes	12	11.9
Fear of recurrence	No	92	91.1
	Yes	9	8.9
Fear of hospitalization	No	88	87.1
	Yes	13	12.9
Fear of chemotherapy sessions	No	74	73.3
	Yes	27	26.7
Fear of death	No	101	100.0
	Yes	0	0.0

The overall score of the patients in the current study ranged from 34 to 62, with a mean of 47.72 ± 7.54.

Overall Needs of Patients

Most participants had moderate needs (67.3%) during their treatment course (►**Fig. 2**), based on the overall scores obtained from the different domains.

Factors Associated with Patient Needs

Sociodemographic factors associated with the participants' overall needs show that the family's socioeconomic status is associated with the overall needs with a chi-square value of 11.87 and a *p*-value of 0.01, which shows statistical significance.

Similarly, the type of family is associated with patients' overall needs with a chi-square value of 20.26 and a *p*-value of 0.001 that shows statistical significance (►**Table 3**).

The results showed that participants in both third and fourth stage cancer had moderate needs. Comorbidities were associated with greater needs, as participants with comorbid conditions tended to have moderate needs. The association between comorbidities and increased needs was statistically significant, with a *p*-value of 0.043.

Higher needs were also correlated with undergoing chemotherapy. Participants receiving chemotherapy were more likely to have moderate needs compared to other treatments. This relationship was statistically significant, with a chi-square value of 13.36 and a *p*-value of 0.004 (►**Table 4**).

Discussion

This study aimed to assess the needs of patients undergoing chemotherapy for cancer. Needs were assessed using a physical, psychological, care, and communication questionnaire. In the current study, 61.4% of the participants were female and 38.6% were male. Almost all (92.1%) participants

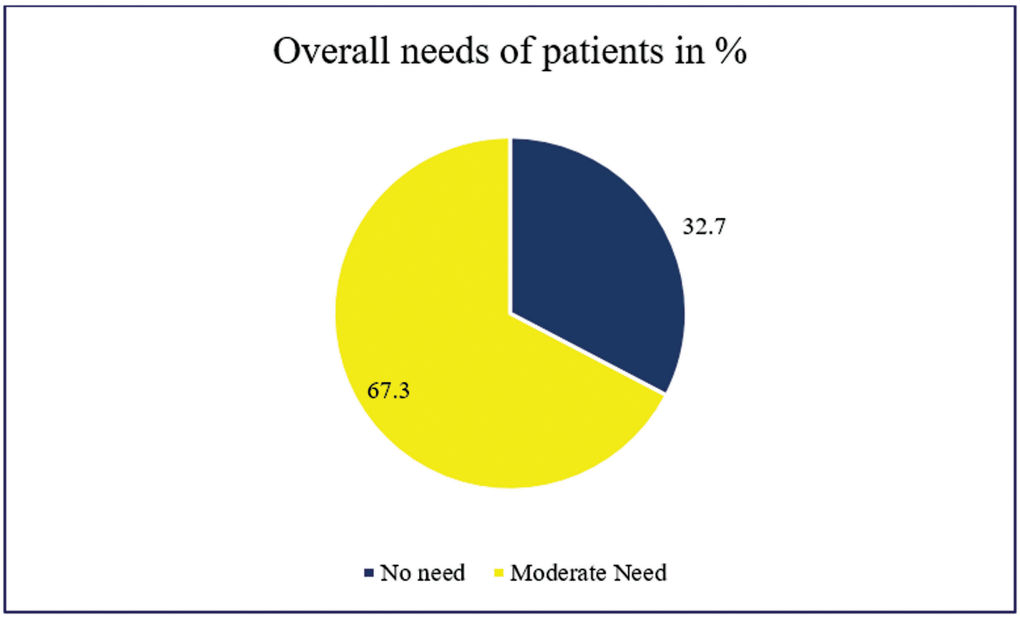

Fig. 2 Overall needs among the study participants.

Table 3 Association between sociodemographic variables and needs of the participants

Sociodemographic variables		Overall needs of patients							
		No need		Moderate need		High need			
		N	%	*N*	%	*N*	%	Chi-square value	*p*-Value
Gender	Male	17	51.5	22	32.4	0	0.0	3.442	0.064[a]
	Female	16	48.5	46	67.6	0	0.0		
Religion	Hindu	33	100.0	60	88.2	0	0.0	4.216	0.121[a]
	Christian	0	0.0	4	5.9	0	0.0		
	Muslim	0	0.0	4	5.9	0	0.0		
	Others	0	0.0	0	0.0	0	0.0		
Locality	Urban	11	33.3	35	51.5	0	0.0	2.947	0.086[a]
	Rural	22	66.7	33	48.5	0	0.0		
Marital status	Married	33	100.0	68	100.0	0	0.0	4.005	0.549[a]
	unmarried	0	0.0	0	0.0	0	0.0		
	Divorced	0	0.0	0	0.0	0	0.0		
	Separated	0	0.0	0	0.0	0	0.0		
	Widow/widower	0	0.0	0	0.0	0	0.0		
Education status of the head of the family	Illiterate	11	33.3	23	33.8	0	0.0		
	Primary education	1	3.0	5	7.4	0	0.0		
	Secondary education	5	15.2	6	8.8	0	0.0		
	High school education	3	9.1	13	19.1	0	0.0		
	Pre-university	7	21.2	14	20.6	0	0.0		
	Diploma/degree	6	18.2	7	10.3	0	0.0		
	Postgraduate	0	0.0	0	0.0	0	0.0		

(*Continued*)

Table 3 (*Continued*)

Sociodemographic variables		Overall needs of patients							
		No need		Moderate need		High need			
		N	%	*N*	%	*N*	%	Chi-square value	*p*-Value
Occupation status	Unemployed	12	36.4	12	17.6	0	0.0	4.710	0.194[a]
	Unskilled	3	9.1	11	16.2	0	0.0		
	Semiskilled	9	27.3	25	36.8	0	0.0		
	Skilled	9	27.3	20	29.4	0	0.0		
	Retired	0	0.0	0	0.0	0	0.0		
Living status	Living alone	0	0.0	0	0.0	0	0.0	–	–
	Living with spouse and children	33	100.0	68	100.0	0	0.0		
	Living with parents	0	0.0	0	0.0	0	0.0		
	Others	0	0.0	0	0.0	0	0.0		
Socioeconomic status of the family	7,008 and above	6	18.2	1	1.5	0	0.0	11.878	0.018[b]
	3,504–3,503	20	60.6	46	67.6	0	0.0		
	2,102–3,503	4	12.1	11	16.2	0	0.0		
	1,051–2,101	3	9.1	5	7.4	0	0.0		
	1,050 and below	0	0.0	5	7.4	0	0.0		

Note: Values are expressed as frequency and percentages.
[a]*p*-Value is by chi-square test.
[b]*p*-Value of less than 0.05 is considered to be statistically significant.

Table 4 Association between clinical profile and needs of the participants

		Overall needs of patients							
		No need		Moderate need		High need			
Case history		*N*	%	*N*	%	*N*	%	Chi-square value	*p*-Value
Stage of cancer	3	20	19.8	38	37.6	0	0.0	0.13	0.711
	4	13	12.9	29	28.7	0	0.0		
Type of tumor	Regional	1	1.0	3	3.0	0	0.0	0.14	0.93
	Localized metastasis	28	27.7	56	55.4	0	0.0		
	Metastasis	4	4.0	9	8.9	0	0.0		
	Unknown	0	0.0	0	0.0	0	0.0		
Comorbidities	Diabetes mellitus	0	0.0	3	3.0	0	0.0	9.34	0.043
	Diabetes mellitus and cardiovascular disease	0	0.0	3	3.0	0	0.0		
	Diabetes mellitus and hypertension	0	0.0	6	5.9	0	0.0		
	Hypertension	3	3.0	1	1.0	0	0.0		
	Nil	30	29.7	55	54.5	0	0.0		
Treatment	Surgery	0	0.0	0	0.0	0	0.0	13.36	0.004[a]
	Chemotherapy	22	21.8	45	44.6	0	0.0		
	Radiation	0	0.0	0	0.0	0	0.0		
	Surgery + chemotherapy	2	2.0	13	12.9	0	0.0		
	Chemotherapy + radiation	0	0.0	6	5.9	0	0.0		
	Surgery + chemotherapy + radiation	9	8.9	4	4.0	0	0.0		

Table 4 (*Continued*)

		Overall needs of patients							
		No need		Moderate need		High need			
Case history		*N*	%	*N*	%	*N*	%	Chi-square value	*p*-Value
Type of cancer	Acute leukemia	2	2.0	4	4.0	0	0.0	6.77	0.561
	Breast cancer	5	5.0	8	7.9	0	0.0		
	Colon cancer	0	0.0	2	2.0	0	0.0		
	Esophageal cancer	1	1.0	10	9.9	0	0.0		
	Leiomyosarcoma	1	1.0	2	2.0	0	0.0		
	Lung cancer	11	10.9	23	22.8	0	0.0		
	Ovarian cancer	1	1.0	4	4.0	0	0.0		
	Rectal cancer	9	8.9	9	8.9	0	0.0		
	Stomach cancer	3	3.0	6	5.9	0	0.0		

Note: Values are expressed as frequency and percentages, Regional: Tumor confined to the primary site and its surrounding tissues, possibly involving nearby lymph nodes. Localized metastasis: Tumor localized at the primary site with evidence of metastasis to regional lymph nodes. Metastasis: Presence of distant metastasis beyond the primary site.
[a]*p*-Value is by chi-square test, and a *p*-value of less than 0.05 is considered to be statistically significant.

were Hindu, 4% were Muslim, and 4% were Christian. Among the participants, 54.5% were from rural areas and 45.5% were from urban areas. In the current study, 33.7% of the participants were illiterate, while 12.9% had a diploma or degree. Most participants in the present study (33.7%) were semi-skilled and the least (13.9%) were unskilled.

Most of the participants in the current study have physical needs, as they had symptoms of loss of appetite, pain, nausea and vomiting, loss of hair, and diarrhea, and a few participants had breathlessness. The physical domain score was also high for all participants. This result aligns with findings from a study by Williamson et al, which showed patients had greater unmet needs related to physical symptoms arising during chemotherapy treatment.[10] Another cross-sectional study showed similar results, where most physical symptoms were nausea (23%), hair fall, pain, decreased appetite (40.1%), and anemia.[11]

In the psychological domain, most participants in the current study experienced anxiety and stress during chemotherapy. Some participants had a fear of chemotherapy sessions and skipped some of the sessions due to fear (26.7%). Few participants (11.8%) felt lonely during the treatment, and 8.9% feared cancer recurrence even after the chemotherapy. According to some participants in the current study, their fear of recurrence was also related to the high cost of treatment. Chaturvedi mentioned that depression (13–40%) and anxiety are cancer patients' most common psychiatric disorders.[12] Another cross-sectional study in North India shows that most participants had depression (55.7%), and the results concur with the current study (9.9%).[13]

The hospital domain score was lower in the present study; however, participants expressed overall satisfaction with the care provided by doctors and nurses, the availability of health care professionals during emergencies, and the prompt response to any adverse reactions during chemotherapy. The findings align with a study conducted in Indonesia, where chemotherapy patients reported high self-satisfaction with care and a strong fulfillment of their needs (98%).[14]

Patients had a moderate need (20.8%) for chemotherapy information. A moderate need (77.2 %) was observed during chemotherapy for information regarding adverse drug reactions. Five percent of the participants felt they needed information about government or private financial schemes concerning emergencies and self-management of adverse drug reactions. Information on the current state of illness, contact information for the treating physician, and the total cost of chemotherapy, were moderately needed by participants. The results of our study are contrary to those reported by Meredith et al, who observed that 79% of cancer patients wanted information about cancer and chemotherapy.[15] In a systematic review by Tariman et al, prognosis, diagnosis, and treatment options were identified as the top three information needs.[16] Another cross-sectional study conducted by Mekuria et al, it was observed that the information about the particular type of cancer and the disease staging is the most important to 67% of cancer patients, followed by 63.3% who want to know about the side effects of chemotherapy and how to deal with them, and 51.8% who want to know about prognosis (survival).[17]

In the current study, 19.8% of participants mentioned needing family support during chemotherapy. In most cases (43.6 %), participants required financial assistance. Transportation services were required by 35.6% of the participants to attend chemotherapy sessions and 21% of participants reported requiring supportive care during chemotherapy.

Similar results were found in a study by Longo et al, where the burden of treatment cost and the supportive care from the family members are the major unmet needs in chemotherapy patients.[18]

In the current study, socioeconomic status and family type were associated with moderate need during chemotherapy. The findings were similar to those of a study conducted in South India comparing sociodemographic factors and the clinical extent of cancer.[19] The current study showed that most participants had moderate needs (67.3%) during treatment.

The current study provides valuable insights into the specific needs of cancer patients undergoing chemotherapy. By understanding and addressing these needs, health care providers can optimize patient-centered care and enhance patients' overall quality of life undergoing chemotherapy. Further research should explore tailored interventions to meet these needs and evaluate their impact on patient outcomes. By implementing these strategies, health care professionals can contribute to better outcomes and improved experiences for patients with cancer undergoing chemotherapy.

Limitations of this study include its cross-sectional design, preventing causal inferences, potential biases associated with self-reported data, limited generalizability due to the study's specific geographic focus, and the absence of a control group for comparative analysis. The 2-month study duration may not capture long-term variations in patients' needs. Despite these limitations, the study provides valuable insights into chemotherapy needs, offering a basis for future research and interventions.

Conclusion

The study findings underscore the moderate needs of cancer patients undergoing chemotherapy, particularly in the physical and psychological domains. These results emphasize the importance of developing new plans or policies to alleviate the burden and improve the quality of life of individuals receiving cancer chemotherapy.

Patient Consent

Informed consent was obtained from each participant before the commencement of the study.

Conflict of Interest

None declared.

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