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Original Research Article

Effect of chemotherapy on cognition and depression among solid tumor cancer patients in a tertiary care hospital

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ABSTRACT

Background: Chemotherapy is a key treatment modality for solid tumors but is often associated with cognitive impairment, depression, and reduced quality of life. Early identification of these complications is important for improving patient outcomes and treatment adherence.
Methods: A prospective cohort study was conducted over six months in the Department of Medical Oncology, Sri Ramachandra Hospital, Chennai. Adult patients (18-65 years) with solid tumors receiving platinum-based agents, taxanes, or antitumor antibiotics were enrolled. A total of 267 patients completed the study. Cognitive function, depression, quality of life, and medication adherence were assessed at baseline and follow-up using the Functional Assessment of Cancer Therapy-Cognitive Function (FACT-Cog), Brief Edinburgh Depression Scale (BEDS), European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), and Medication Adherence Rating Scale (MARS), respectively.
Results: Among the 267 participants, females constituted the majority. Significant deterioration in cognitive function and increased depression scores were observed during chemotherapy, particularly among patients receiving platinum-based regimens. Depression scores showed significant worsening at weeks 8 and 12 in the platinum-based group ($p<0.05$). Quality of life declined significantly, with reductions in physical, emotional, role, and cognitive functioning. Overall health status deteriorated in 75.6% of patients. Medication adherence remained satisfactory throughout the study. Adverse drug reactions were reported more frequently in patients receiving platinum-based chemotherapy.
Conclusions: Platinum-based chemotherapy is associated with increased cognitive impairment, depression, and reduced quality of life in patients with solid tumors. Routine screening for cognitive dysfunction and depression should be incorporated into oncology care to enable timely interventions and improve patient-centered outcomes.

Keywords: Chemotherapy, Cognitive impairment, Depression, FACT-Cog, Quality of life, Solid tumors, Medication adherence

INTRODUCTION

Cancer is a major global health burden and remains one of the leading causes of morbidity and mortality worldwide. Advances in cancer therapy, particularly chemotherapy, have significantly improved survival outcomes among patients with solid tumors. However, chemotherapy is associated with several adverse effects that extend beyond physical toxicity and may negatively affect cognitive function, psychological well-being, and quality of life.[1]

Chemotherapy-related cognitive impairment (CRCI), commonly known as "chemo brain," is characterized by difficulties in memory, attention, executive function, and information processing. Studies have reported that cognitive dysfunction may occur before, during, and after chemotherapy, affecting up to 75% of patients during treatment and persisting in a subset of survivors.[2,3] The pathophysiology of CRCI is multifactorial and involves neuroinflammation, oxidative stress, direct neurotoxicity, hormonal changes, and genetic susceptibility.[4]

Depression is another prevalent psychological complication among cancer patients undergoing chemotherapy. The emotional impact of cancer diagnosis, treatment-related adverse effects, uncertainty regarding prognosis, and social challenges contribute significantly to depressive symptoms. Depression has been shown to adversely affect treatment adherence, cognitive functioning, and overall quality of life among oncology patients.[5,6]

Quality of life (QoL) has emerged as an important outcome measure in cancer care. While chemotherapy improves disease control and survival, treatment-related cognitive impairment and psychological distress may substantially reduce physical, emotional, social, and functional well-being. Therefore, regular assessment of cognitive function, depression, and QoL is essential for comprehensive cancer management.[7]

Although several studies have evaluated chemotherapy-induced cognitive impairment and depression independently, limited evidence is available regarding their combined impact on quality of life among Indian patients with solid tumors receiving different chemotherapy regimens. Hence, the present study was undertaken to evaluate chemotherapy-induced cognitive impairment, depression, quality of life, medication adherence, and adverse drug reactions among patients with solid tumors receiving chemotherapy and to assess the influence of different chemotherapy regimens on these outcomes.

METHODS

Study design and setting

A prospective observational cohort study was conducted in the Department of Medical Oncology, Sri Ramachandra Hospital, Chennai, Tamil Nadu, India, from October 2022 to March 2023. The study was designed to evaluate chemotherapy-induced cognitive impairment, depression, quality of life, medication adherence, and adverse drug reactions among patients with solid tumors receiving chemotherapy.

Study population

Patients diagnosed with solid tumors and receiving chemotherapy during the study period were screened for eligibility. Eligible patients who provided written informed consent were enrolled consecutively in the study.

Inclusion criteria

Patients aged between 18 and 65 years with a histopathologically confirmed diagnosis of a solid tumor and receiving chemotherapy were eligible for inclusion in the study. Only patients who were willing to provide written informed consent and participate throughout the study period were enrolled.

Exclusion criteria

Patients were excluded if they had pre-existing psychiatric disorders or neurological illnesses that could affect cognitive function, as these conditions might confound the assessment of chemotherapy-related cognitive impairment and depression. Patients diagnosed with primary brain tumors or brain metastases were also excluded due to the direct impact of these conditions on cognitive outcomes. Additionally, individuals with severe communication or sensory impairments that could interfere with questionnaire-based assessments and those unwilling to participate in the study were excluded.

Sample size

A total of 267 patients who met the eligibility criteria and completed the study assessments were included in the final analysis.

Data collection

Demographic and clinical data, including age, gender, diagnosis, stage of cancer, chemotherapy regimen, comorbidities, and treatment details, were collected from patient medical records and direct interviews.

Assessment of cognitive impairment

Cognitive function was assessed using the Functional Assessment of Cancer Therapy-Cognitive Function (FACT-Cog) questionnaire. The instrument evaluates perceived cognitive impairment, comments from others, cognitive abilities, and the impact of cognitive changes on quality of life.

Assessment of depression

Depressive symptoms were assessed using the Brief Edinburgh Depression Scale (BEDS). Scores were recorded at baseline and during follow-up visits to determine the impact of chemotherapy on psychological well-being.

Assessment of quality of life

Quality of life was evaluated using the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30), which assesses global health status, functional domains, and symptom scales.

Assessment of medication adherence

Medication adherence was assessed using the Medication Adherence Rating Scale (MARS). The questionnaire evaluated patients' adherence to prescribed medications during the study period.

Assessment of adverse drug reactions

Adverse drug reactions (ADRs) reported during chemotherapy were documented and categorized according to the affected organ system. Causality assessment was performed using standard pharmacovigilance criteria.

Follow-up

Patients were assessed at four time points during the study: baseline (prior to initiation of chemotherapy), week 4, week 8, and week 12 following the commencement of chemotherapy. At each visit, cognitive function, depression, quality of life, and medication adherence were evaluated using the FACT-Cog, BEDS, EORTC QLQ-C30, and MARS questionnaires, respectively. Adverse drug reactions experienced during the study period were also documented. Changes in study outcomes over time and across different chemotherapy regimens were analyzed and compared.

Statistical analysis

Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) software version 26.0. Continuous variables were expressed as mean ± standard deviation (SD), and categorical variables were expressed as frequencies and percentages. Appropriate statistical tests were used to compare study variables. A p value of <0.05 was considered statistically significant.

Ethical considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee of Sri Ramachandra Institute of Higher Education and Research, Chennai (IEC Approval No. CSP/22/OCT/117/530). Written informed consent was obtained from all participants prior to enrolment. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and Good Clinical Practice guidelines.

RESULTS

The demographic and clinical characteristics of the study participants are presented in Table 1. A total of 267 patients completed the study.

Table 1: Demographic and clinical characteristics of study participants (n=267).

Variables	Category	N (%)
Gender	Male	93 (34.8)
	Female	174 (65.2)
Age (years)	Mean±SD	51.48±9.89
Occupation	Business	8 (3.0)
	Employed	102 (38.2)
	Unemployed	157 (58.8)
Marital status	Married	252 (94.4)
	Unmarried	15 (5.6)
Family type	Joint	192 (71.9)
	Nuclear	51 (19.1)
	Extended	15 (5.6)
	Living alone	9 (3.4)
Cancer stage	Stage I	4 (1.5)
	Stage II	58 (21.7)
	Stage III	112 (41.9)
	Stage IV	93 (34.8)
Socioeconomic status	Upper	61 (22.8)
	Upper middle	76 (28.5)
	Lower middle	108 (40.4)
	Upper lower	13 (4.9)
	Lower	9 (3.4)
Education	Illiterate	10 (3.7)
	Primary	63 (23.6)
	Secondary	79 (29.6)
	Graduate	90 (33.7)
	Postgraduate	19 (7.1)
Cancer type	Breast	73 (27.3)
	Respiratory/thoracic	32 (12.0)
	Head and neck	26 (9.7)
	Gynecological	28 (10.5)
	Genitourinary	46 (17.2)
	Gastrointestinal	62 (23.2)
Chemotherapy regimen	Platinum-based agents	101 (37.8)
	Antitumor antibiotics	86 (32.2)
	Taxanes	80 (30.0)

The majority were female (65.2%), with a mean age of 51.48±9.89 years. Most participants were unemployed (58.8%), married (94.4%), and belonged to joint families (71.9%). Stage III cancer was the most common disease stage (41.9%), followed by Stage IV (34.8%). The majority of patients belonged to the lower-middle

socioeconomic class (40.4%) and had completed graduation (33.7%). Breast cancer was the most frequently observed malignancy (27.3%), followed by gastrointestinal cancer (23.2%) and genitourinary cancer (17.2%). Regarding chemotherapy regimens, 37.8% of patients received platinum-based agents, 32.2% received antitumor antibiotics, and 30.0% received taxanes (Table 1).

Patients receiving platinum-based chemotherapy (Group A) demonstrated a greater decline in cognitive function compared with patients receiving antitumor antibiotics (Group B) and taxane-based chemotherapy (Group C). FACT-Cog scores showed progressive deterioration from baseline to week 12, indicating significant chemotherapy-induced cognitive impairment among patients receiving platinum-based regimens.

Depression scores assessed using the Brief Edinburgh Depression Scale (BEDS) increased during follow-up in all treatment groups. The incidence and severity of depression were higher among patients receiving platinum-based chemotherapy, with significant differences observed between groups during the 12-week follow-up period.

Quality-of-life assessment using the EORTC QLQ-C30 demonstrated significant deterioration in overall health status during chemotherapy. Approximately 75.6% of patients experienced a reduction in global health status. Group A showed significantly poorer physical, emotional, role, and cognitive functioning compared with Groups B and C. Social functioning did not differ significantly between groups.

Medication adherence assessed using the Medication Adherence Rating Scale (MARS) improved during the study period. Mean adherence scores increased from baseline to week 12 in all groups, with no statistically significant difference between treatment groups at week 12 (p=0.712), indicating satisfactory adherence throughout the study.

Adverse drug reactions (ADRs) were reported more frequently among patients receiving platinum-based chemotherapy. Commonly reported ADRs included diarrhoea, constipation, decreased appetite, rash, dizziness, dyspnoea, skin peeling, itching, palpitations, and discoloration of hands. The overall burden of ADRs was higher in Group A than in Groups B and C.

Overall, platinum-based chemotherapy was associated with a greater risk of cognitive impairment, depression, reduced quality of life, and increased adverse drug reactions compared with antitumor antibiotics and taxane-based chemotherapy.

The one-way ANOVA analysis of mean depression scores using the BEDS questionnaire showed a statistically significant difference between the groups for group A after week 8 but not for groups B and C (Table 1).

The one-way ANOVA analysis of mean cognitive scores using the FACT-Cog questionnaire showed a statistically significant difference between the groups for group A after week 8 but not for groups B and C (Table 2).

Table 2: Comparison of depression severity using BEDS questionnaire between groups.

Treatment period	Treatment group		Mean±SD	95% Confidence Interval		P value
				Lower bound	Upper bound	
Week 0	Group A	Group C	3.19±3.23	-2.129	0.089	0.079
		Group B	3.09±3.33	-2.196	0.151	0.38
	Group B	Group C	2.49±3.14	-1.128	1.133	1.00
Week 4	Group A	Group C	5.32±3.45	-4.362	1.881	0.56
		Group B	5.25±4.17	-3.649	2.719	0.24
	Group B	Group C	4.95±3.61	-4.081	2.529	0.85
Week 8	Group A	Group C	6.91±3.6	-1.012	6.399	0.05*
		Group B	6.43±3.83	-4.363	3.196	0.05*
	Group B	Group C	6.41±3.92	-.645	7.200	1.23
Week 12	Group A	Group C	8.58±4.0	2.413	44.987	0.04*
		Group B	7.11±4.29	0.+25	0.167	0.02*
	Group B	Group C	6.20±3.64	-1.988	540	0.70

Group A-Platinum-based agents, Group B-Antitumour antibiotics, Group C-Taxanes are represented Mean±SD; *Statistically significant p<0.05

The results of the one-way ANOVA analysis of the mean quality of life score, as measured by the EORTC QoL questionnaire, indicated a significant difference between the groups only for group A at week 12, but not for groups B and C (Table 3).

The result of the one-way ANOVA analysis reveal that the mean physical functioning scores at week 12 are significantly different between the groups. Group A exhibits considerably lower physical, role, and emotional performance than the other groups; social functioning did

not significantly differ between the groups.

The results of the one-way ANOVA analysis show that there is a significant difference between the groups' mean symptoms scale scores at week 12. In comparison to the other two groups, Group A has a negative impact on fatigue, nausea, vomiting, and diarrhoea, whereas Group B has a negative effect on sleep disturbance and loss of appetite. There is no statistical significance for pain, dyspnea, constipation, or financial troubles (Table 5).

Table 3: Comparison of cognition severity score using FACT COG questionnaire between groups.

FACT-Cog	Treatment period	Treatment class		Mean±SD	95% Confidence Interval		P value
					Lower bound	Upper bound	
Cog PCI	Week 0	Group A	Group C	61.54± 2.92	-1.098	1.102	0.78
			Group B	61.54±3.29	-1.493	0.836	1
		Group B	Group C	61.87±3.30	-1.988	0.54	0.76
	Week 12	Group A	Group C	40.49± 2.71	1.622	10.156	0.03*
			Group B	43.38±4.86	5.112	47.732	0.02*
		Group B	Group C	45.13±5.67	-1.434	0.455	0.24
Cog OTH	Week 0	Group A	Group C	16.08±1.99	-1.085	0.448	0.89
			Group B	14.10±2.37	-0.589	0.859	0.59
		Group B	Group C	14.56±1.82	-1.192	. 285	0.31
	Week 12	Group A	Group C	9.77±0.81	-0.527	0.087	0.21
			Group B	13.64±10.23	-0.493	0.087	0.22
		Group B	Group C	14.31±11.38	-0.313	0.278	0.99
Cog PCA	Week 0	Group A	Group C	24.42±4.41	-2.663	0.251	0.12
			Group B	24.99±3.94	-1.948	0.805	0.59
		Group B	Group C	25.62±3.51	-1.453	0.792	0.53
	Week 12	Group A	Group C	19.33±1.59	-0.917	0.267	0.39
			Group B	19.49±1.68	-0.707	0.411	0.8
		Group B	Group C	19.66±1.57	-0.748	0.393	0.74
Cog QoL	Week 0	Group A	Group C	12.68±1.59	-4.885	1.632	0.46
			Group B	13.64±10.23	-4.036	2.121	0.74
		Group B	Group C	14.31±11.38	-3.809	2.471	0.87
	Week 12	Group A	Group C	9.267±1.28	2.629	12.571	0.04*
			Group B	10.01±1.55	1.066	15.956	0.01*
		Group B	Group C	11.33±2.08	-0.753	0.163	0.28

Group A-Platinum-based agents, Group B-Antitumour antibiotics and Group C-Taxanes are represented as Mean±SD, *Statistically significant P<0.05

Table 4: Comparison of quality-of-life score using EORTC QOL C-30 questionnaire.

EORTC domain	Treatment period	Treatment class		Mean±SD	95% Confidence Interval		P value
					Lower bound	Upper bound	
QoL	Week 0	Group A	Group C	55.65±10.22	0.95	-4.38	3.41
			Group B	56.63±10.22	0.8	-4.66	2.69
		Group B	Group C	56.14±13.3	0.94	-3.25	4.25
	Week 12	Group A	Group C	59.27±6.70	-9.46	0.48	0.03*
			Group B	60.03±6.36	-12.57	-2.62	0.04*
		Group B	Group C	57.50±8.25	0.04	0.03	5.02

Group A-Platinum-based agents, Group B-Antitumour antibiotics and Group C-Taxanes are represented by Mean±SD, *Statistically significant P<0.05

Adverse drug reactions

In terms of adverse drug reactions, group A has been reported to cause more side effects than groups B and C. Specifically, group A has a higher incidence of diarrhoea (13.86%), decreased appetite (1.98%), constipation (11.88%), rash (3.19%), dizziness (3.96%), dyspnoea(1.98%), peeling of the skin (1.98%), itching (1.98%), palpitation (2.97%), and discoloration of the hands (0.99%). Group B has the next highest incidence of adverse reactions, with diarrhoea (15.11%), decreased appetite (1.16%), constipation (15.11%), rash (2.32%), dizziness (1.16%), dysponea (1.16%), skin peeling (3.48%), itching (2.32%), and palpitation (2.32%). Group

C has a lower incidence of adverse reactions, with diarrhoea (17.5%), decreased appetite (3.75%), constipation (15%), rash (2.5%), dizziness (2.5%), dysponea(2.5%), peeling of the skin (1.25%), itching (1.25%), and palpitation (1.25%).

Using One-way ANOVA, the mean week for medication adherence at week 12 reveals statistically insignificant variations between groups.

Table 5: Comparison of functional scale score using EORTC QOL C-30 questionnaire.

EORTC domain	Treatment period	Treatment class		Mean±SD	95% Confidence Interval		P value
					Lower bound	Upper bound	
PF2	Week 0	Group A	Group C	59.28±11.77	0.91	-3.34	2.35
			Group B	58.71±11.39	1	-2.68	2.7
		Group B	Group C	57.59±14.89	0.82	-3.34	5.59
	Week 12	Group A	Group C	52.94±7.56	0	0	0.02*
			Group B	52.93±8.94	0.024	5.75	0.04*
		Group B	Group C	53.09±7.75	0.9	-3.25	2.24
RF 2	Week 0	Group A	Group C	60.16±13.98	0.37	-2.29	8.39
			Group B	58.53±14.34	0.73	-3.42	6.67
		Group B	Group C	57.11±15.52	0.79	-3.73	6.57
	Week 12	Group A	Group C	52.19±12.30	-10.444	-0.247	0.03*
			Group B	53.04±12.69	0	16.67	0.02*
		Group B	Group C	51.68±11.85	0.74	-2.98	5.71
EF	Week 0	Group A	Group C	60.43±15.33	0.68	-3.59	7.57
			Group B	59.06±13.91	0.81	-3.9	6.64
		Group B	Group C	58.44±16.70	0.96	-4.76	6
	Week 12	Group A	Group C	55.30±10.12	11.11	55.56	0.02*
			Group B	52.97±7.29	0.18	22.22	0.03*
		Group B	Group C	53.24±9.56	0.98	-3.43	2.9
CF	Week 0	Group A	Group C	68.19±13.50	0.15	-8.87	1.05
			Group B	69.19±13.53	0.87	-5.69	3.68
		Group B	Group C	72.10±13.63	0.32	-7.69	1.87
	Week 12	Group A	Group C	60.48±9.10	2.413	44.987	0.04*
			Group B	59.26±9.16	0.25	0.167	0.02*
		Group B	Group C	58.71±8.55	0.94	-3.65	2.72

Group A-Platinum-based agents, Group B-Antitumour antibiotics and Group C-Taxanes are represented by Mean±SD, *Statistically significant P<0.05

Table 6: Comparison of symptoms scale using EORTC QOL C-30 questionnaire between groups.

EORTC	Treatment period	Treatment class		Mean±SD	95% Confidence Interval		P value
					Lower bound	Upper bound	
FA	Week 0	Group A	Group C	36.66±13.41	0.49	-2.66	7.59
			Group B	36.40±14.37	0.99	-4.57	5.11
		Group B	Group C	34.20±14.14	.55	-2.74	7.13
	Week 12	Group A	Group C	43.20±11.75	1.622	10.156	0.03*
			Group B	45.89±10.35	5.112	47.732	0.04*
		Group B	Group C	46.48±9.98	0.93	-4.36	3.20
NV	Week 0	Group A	Group C	19.94±12.06	0.04	-10.44	-0.25
			Group B	21.03±12.76	0.86	-5.90	3.73
		Group B	Group C	25.29±16.89	0.10	-9.17	0.65
	Week 12	Group A	Group C	36.14±10.47	1.622	10.156	0.03*
			Group B	33.17±5.10	1.066	15.956	0.01*
		Group B	Group C	35.10±9.41	0.28	-4.92	1.05
SL	Week 0	Group A	Group C	33.00±21.48	0.64	-12.13	5.46
			Group B	35.95±24.76	0.68	-11.26	5.36
		Group B	Group C	36.34±25.60	0.99	-8.86	8.09

Continued.

EORTC	Treatment period	Treatment class		Mean±SD	95% Confidence Interval		P value
					Lower bound	Upper bound	
	Week 12	Group A	Group C	47.97±16.52	1.066	15.956	1.41
			Group B	50.97±17.79	0.51	-9.36	0.01*
		Group B	Group C	53.28±20.81	0.68	-8.78	0.03*
AP	Week 0	Group A	Group C	26.48±23.65	0.87	-11.49	7.45
			Group B	26.14±24.39	1	-8.61	9.28
		Group B	Group C	28.50±29.67	0.81	-11.49	6.76
	Week 12	Group A	Group C	38.01±22.99	0.9	-10.23	7.06
			Group B	36.28±25.37	-8.823	-0.288	0.03*
		Group B	Group C	39.60±21.90	11.11	55.56	0.02*
DI	Week 0	Group A	Group C	7.30±18.59	0.49	-9.24	3.22
			Group B	5.55±13.26	0.76	-4.14	7.64
		Group B	Group C	10.31±19.36	0.15	-10.77	1.25
	Week 12	Group A	Group C	1.15±6.09	1.622	10.156	0.04*
			Group B	2.29±11.67	5.112	47.732	0.03*
		Group B	Group C	1.65±8.94	0.89	-2.66	3.94

Group A-Platinum-based agents, Group B-Antitumour antibiotics and Group C-Taxanes are represented by Mean±SD, *Statistically significant P<0.05

Table:7: Adverse drug reactions.

Adverse drug reactions	No. of patients (N=267), N (%)		
	Group A (n=101)	Group B (n=86)	Group C (n=80)
Diarrhoea	14 (13.86)	13 (15.11)	14 (17.5)
Decreased appetitie	2 (1.98)	1 (1.16)	3 (3.75)
Constipation	12 (11.88)	13 (15.11)	12 (15)
Rash	3 (2.97)	2 (2.32)	2 (2.5)
Dizziness	4 (3.96)	1 (1.16)	2 (2.5)
Dyspnoea	2 (1.98)	1 (1.16)	2 (2.5)
Pelling of skin	2 (1.98)	3 (3.48)	1 (1.25)
Itching	2 (1.98)	2 (2.32)	1 (1.25)
Palpitation	3 (2.97)	2 (2.32)	1 (1.25)
Discoloration of hands	1 (0.99)	0	0

Group A-Platinum-based agents, Group B-Antitumour antibiotics and Group C-Taxanes

Table 8: Medication adherence.

MARS	Group A	Group B	Group C	P value
Week 0	4.59±1.23	4.50±1.29	4.56±1.12	0.881
Week 12	9.10±0.72	9.17±0.74	9.09±0.64	0.712

Group A-Platinum-based agents, Group B-Antitumour antibiotics and Group C-Taxanes

DISCUSSION

A prospective study was conducted over a period of six months (October 2022 to March 2023) among 267 patients with solid tumors receiving chemotherapy. The patients were assessed for cognitive function, depression, quality of life, medication adherence, and adverse drug reactions in the Medical Oncology Department of Sri Ramachandra Hospital, Chennai.

The present study demonstrated a higher proportion of female participants (65.16%) compared with males (34.83%). Although cancer incidence has generally been reported to be higher among males than females due to genetic and environmental factors, the predominance of breast and gynecological cancers in the present study may explain the higher proportion of female participants. Similar findings have been reported in previous studies evaluating quality of life among cancer patients.[35,40]

The mean age of participants was approximately 51 years across all treatment groups. Middle age is associated with an increased prevalence of cancer risk factors and a higher incidence of several malignancies.[41] Similar age distributions have been reported among patients undergoing chemotherapy.[27]

The majority of participants were unemployed at the time of the study. This finding differs from previous reports in which a higher proportion of patients were employed.[27]

The economic burden associated with cancer diagnosis and treatment may contribute to reduced employment and financial instability among affected individuals.

Most patients in the present study were diagnosed with advanced-stage disease, predominantly Stage III and Stage IV cancers. Similar findings have been reported among patients undergoing chemotherapy, indicating that a large proportion of patients present at advanced stages of disease.[27]

The majority of patients belonged to the lower-middle socioeconomic class. This finding differs from previous reports that identified a higher proportion of patients from upper socioeconomic groups.[42] Differences in geographic location, healthcare accessibility, and socioeconomic characteristics of the study population may explain this variation.

Most participants had completed graduation, which contrasts with previous findings reporting a higher proportion of patients with lower educational attainment.[27] Educational status may influence disease awareness, healthcare-seeking behavior, and treatment compliance.

A significant decline in cognitive function was observed among patients receiving chemotherapy, particularly those receiving platinum-based regimens. FACT-Cog scores demonstrated deterioration in perceived cognitive impairment and cognitive quality of life over the study period. Similar findings have been reported in previous studies evaluating chemotherapy-related cognitive impairment, particularly among patients receiving platinum-based chemotherapy.[22,25]

Depression scores increased significantly during follow-up, especially among patients receiving platinum-based chemotherapy. Previous studies have also reported a high prevalence of depression among patients undergoing chemotherapy.[31,32] The psychological burden of cancer diagnosis and treatment-related adverse effects may contribute to the development of depressive symptoms.

Quality of life declined significantly during chemotherapy, with reductions observed in physical, emotional, role, and cognitive functioning. Approximately 75.6% of patients experienced deterioration in overall health status. Similar findings have been reported in studies assessing quality of life among patients receiving chemotherapy.[43] The decline in quality of life may be attributed to disease burden, treatment-related toxicities, and psychological distress.

Medication adherence remained satisfactory throughout the study period, with no significant differences observed among the treatment groups. This finding differs from previous reports evaluating medication adherence among cancer patients.[44] Adequate adherence suggests that the observed cognitive impairment and depressive symptoms were more likely attributable to chemotherapy-related effects rather than treatment non-compliance.

Adverse drug reactions were reported more frequently among patients receiving platinum-based chemotherapy. Common adverse events included diarrhea, decreased appetite, constipation, rash, dizziness, alopecia, skin peeling, pruritus, sleep disturbances, and skin discoloration. Similar findings have been documented in previous studies reporting a higher incidence of adverse drug reactions associated with platinum-based regimens.[45]

Overall, the findings of the present study indicate that platinum-based chemotherapy has a substantial impact on cognitive function, depression, and quality of life among patients with solid tumors. Routine screening for cognitive dysfunction and depression during chemotherapy may facilitate early intervention and improve patient-centered outcomes.

The present study has certain limitations. The relatively small sample size and unequal gender distribution, with a higher proportion of female participants, may limit the generalizability of the findings. In addition, the limited study duration may have constrained participant recruitment and data collection. Furthermore, the study did not adequately assess the drug-specific effects on cognitive impairment and depression, limiting comparability within the treatment groups.

CONCLUSION

This study concludes that receiving platinum-based chemotherapy significantly increases the risk of cognitive impairment and depression. Also, it was shown that chemotherapy substantially diminishes the patient's quality of life. Despite the diagnosis, the therapy should be logically individualised for each patient based on the patient's symptoms in order to ensure the highest possible quality of life. We also looked at the initial significant increase in medication adherence. Nevertheless, with the long-term effects of chemotherapy, medication adherence may gradually decline. As a result, early detection and treatment of depression and cognitive impairment should be considered a key clinical priority.

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