

Assessment of Treatment Adherence and Its Association with Quality of Life among Cancer Patients Undergoing Chemotherapy at Selected Cancer Hospitals in Bihar

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Abstract

Adherence to treatment is necessary to achieve the benefits of chemotherapy. Treatment-related toxicity and personal issues, including psychological distress, financial problems, and/or absence of available support, may prevent adherence. QoL may be related to the treatment, the cancer, or both. This study was conducted with the objective to assess the adherence and its association with quality of life (QoL) among cancer patients receiving chemotherapy in selected cancer hospitals of Bihar. The study was a quantitative descriptive cross-sectional. The sample size taken was 200. Data were collected through a demographic proforma, a treatment adherence assessment scale and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30). Data were analyzed using frequencies, percents, means, standard deviations, chi-square test and Pearson's correlation coefficient.

For adherence, 51% demonstrated moderate adherence, 35% good adherence, and 14% poor adherence. The mean adherence score was 7.84 with a standard deviation of 1.74. QoL was rated as moderate in 55% of subjects, good in 27%, and poor in 18%. QoL mean score was 63.28±11.46. Age ($\chi^2=9.42$, $p=0.02$), education level ($\chi^2=11.26$, $p=0.01$) and occupation ($\chi^2=6.32$, $p=0.04$) were considerably associated with adherence. Age ($\chi^2=8.56$, $p=0.03$), education ($\chi^2=10.74$, $p=0.01$), occupation ($\chi^2=5.98$, $p=0.05$) and cancer type ($\chi^2=12.42$, $p=0.02$) were associated with QoL. Treatment adherence and QoL were strongly positively correlated ($r=0.72$, $p=0.001$).

Better compliance was a meaningful factor associated with better QoL. These findings endorse the importance of assessing for compliance in routine chemotherapy care, patient education, symptom management, psychosocial support, and individualized nursing follow-up.

Keywords: cancer, chemotherapy, treatment adherence, quality of life, EORTC QLQ-C30, oncology nursing

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Introduction

Cancer is one of the most common causes of morbidity and mortality in humans and places a large physical, psychological, social and economic burden on patients and their families (World Health Organization [WHO], 2024). Chemotherapy remains a key part of the multimodal management of cancer and depends not only upon the use of the medicines, but also upon patients being able to attend doses, take medicines, complete follow-up and follow supportive-care measures. Nausea and vomiting, fatigue and pain, mucositis, poor appetite, disturbed sleep, and emotional distress may be side effects of treatment and may lead to poor adherence (Pearce et al., 2017; Henry et al., 2008; Molassiotis et al., 2006). Adherence is a complex, multidimensional behavior that can be affected by many factors, including patient, disease, therapy, health-system, and socioeconomic factors. Nonadherence to cancer-related therapy can interfere with the processes of cancer treatment. Ongoing participation in therapy, as well as supportive care, may help with symptom management and continuity of care (Sabaté, 2003; Greer et al., 2016; Verbrughe et al., 2013). Educational attainment, employment/job status, treatment burden, psychological distress, family support, and access to services may therefore affect adherence to chemotherapy. Quality of life is also an important patient-reported outcome relevant to

cancer, where survival alone is not fully representative of the cancer experience. The EORTC QLQ-C30 includes items assessing global health/QoL and functional and symptoms scales. QoL is widely used in cancer research (Fayers et al., 2001; Montazeri, 2008). In the present study QoL was measured alongside adherence, as both are likely reciprocally related. That is, worse QoL (higher symptom burden, poorer psychosocial functioning) could reduce adherence, but adherence and supportive treatment may improve QoL. Previous studies showed that symptom burden, anxiety and depression, side effects, and lack of support were negatively associated with adherence and QoL (Jacobs et al., 2019; Pensak et al., 2019; Rashidi et al., 2024), while self-efficacy, organized follow-up, pharmaceutical therapy, and supportive care were positively associated with a positive treatment experience (Puspitasari et al., 2024; Fujii et al., 2022; Fiorentini et al., 2014). Specific evidence for chemotherapy in Bihar is lacking, but understanding this relationship may provide direction for nurses and multidisciplinary oncology care teams to identify patients with poor adherence, thereby proactively initiating practical interventions that address patient needs.

2. Objectives

1. To assess the level of treatment adherence among cancer patients undergoing chemotherapy.

Assessment of Treatment Adherence and Its Association with Quality of Life among Cancer Patients Undergoing Chemotherapy at Selected Cancer Hospitals in Bihar

2. To assess the quality of life of cancer patients undergoing chemotherapy.
3. To determine the association of treatment adherence with selected demographic variables.
4. To determine the association of quality of life with selected demographic and clinical variables.
5. To examine the correlation between treatment adherence and quality of life.

6. 3. Methods

7. 3.1 Study design and setting A quantitative descriptive cross-sectional study was conducted in selected cancer hospitals of Bihar providing chemotherapy and some other specialized care in oncology. This was to assess adherence and quality of life and the association between the study variables at the point of time of data collection. 3.2 Participants and sampling Two hundred adults with cancer undergoing chemotherapy were recruited for the study using non-probability purposive sampling. Adult patients were included if they were aged 18 years and older, receiving chemotherapy treatment, available for data collection, willing to give consent, and able read and complete the questionnaire. Patients with critical illness, severe psychiatric illness or cognitive impairment, those refusing the study or those receiving radiotherapy and surgery without chemotherapy were excluded from the study. 3.3 Measures The data collection tool had three parts: Section A contained socio-demographic details (including age, gender, marital status, education, occupation, type of cancer, duration of illness and duration of chemotherapy), while Section B contained a treatment adherence scale for medication, chemotherapy attendance, follow up visit and prescription as per the study's treatment-adherence scale. Section C used the EORTC QLQ-C30 to measure QoL. The EORTC QLQ-C30 is a multidimensional cancer-specific QoL instrument and its scoring has to be done using the EORTC scoring algorithm (Fayers et al., 2001).

3.4 Data collection and ethics

Permissions were obtained from the concerned hospital authorities and ethical clearance from Institutional Ethical Committee was reported to have been obtained. After an explanation of the study, written informed consent was obtained from the subjects. Participation was voluntary, and confidentiality, anonymity was ensured, and withdrawal from participation was without penalty.

3.5 Statistical analysis

Frequencies, percentages, mean and standard deviation were calculated. Chi-square tests were used to measure the relationship between categorized adherence or QoL and other chosen variables. The tabulated results calculated Pearson's correlation coefficient between treatment adherence and QoL. The results were considered statistically meaningful when $p \leq 0.05$. Because this was a cross-sectional study, the association between treatment adherence and QoL is not considered a causative effect.

4. Results

4.1 Participant characteristics

Characteristic	Category	n (%)
Age	18–30	32 (16)
	31–45	78 (39)
	46–60	64 (32)
	Above 60	26 (13)
Gender	Male	108 (54)
	Female	92 (46)
Marital status	Married	152 (76)
	Unmarried	48 (24)
Education	Primary	40 (20)
	Secondary	94 (47)
	Graduate and above	66 (33)
Occupation	Government employee	24 (12)
	Private employee	52 (26)
	Self-employed	38 (19)
	Unemployed/housewife	86 (43)
Cancer type	Breast	62 (31)
	Lung	34 (17)
	Gastrointestinal	46 (23)
	Blood	22 (11)
	Others	36 (18)
Illness duration	<6 months	44 (22)
	6 months–1 year	78 (39)
	1–3 years	56 (28)
	>3 years	22 (11)
Chemotherapy duration	<3 months	52 (26)
	3–6 months	84 (42)
	6 months–1 year	46 (23)
	>1 year	18 (9)

Assessment of Treatment Adherence and Its Association with Quality of Life among Cancer Patients Undergoing Chemotherapy at Selected Cancer Hospitals in Bihar

Most were aged 31 to 45 years old (39%) or aged 46 to 60 (32%). Most were men (54%) and married (76%), with 47% being high school graduates. Another 43% of the people were unemployed or homemakers. Breast cancer was the most common diagnosis (31%) followed by GI cancer (23%). About half had symptoms for 6-12 months (39%) and most had received chemotherapy for 3-6 months (42%).

4.2 Treatment adherence and quality of life

Outcome	Poor n (%)	Moderate n (%)	Good n (%)	Mean $\pm$ SD
Treatment adherence	28 (14)	102 (51)	70 (35)	7.84 $\pm$ 1.74
Quality of life	36 (18)	110 (55)	54 (27)	63.28 $\pm$ 11.46

Moderate medication adherence was identified among 51% of the sample, and 35% of participants had good medication adherence. Moderate QoL was found in 55% of the sample, with good QoL in 27%. These distributions suggest that patients were tolerating treatment reasonably well, but were not functioning at optimal levels of adherence and perceived well-being.

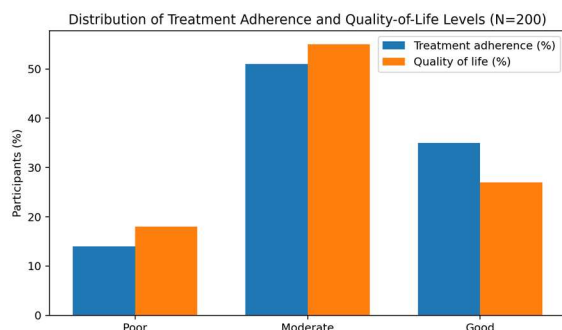


Figure 1. Distribution of treatment-adherence and quality-of-life categories derived from the study dataset.

4.3 Associations with participant characteristics

Outcome	Variable	χ^2	p-value	Interpretation
Treatment adherence	Age	9.42	0.02	Significant
	Gender	1.84	0.39	Not significant
	Education	11.26	0.01	Significant
	Occupation	6.32	0.04	Significant
Quality of life	Marital status	2.15	0.34	Not significant
	Age	8.56	0.03	Significant
	Gender	2.06	0.28	Not significant
	Education	10.74	0.01	Significant
	Occupation	5.98	0.05	Significant/borderl

	on			ine
	Cancer type	12.42	0.02	Significant

The only statistically important differences in adherence were by age, level of education and occupation. QoL was statistically considerably different by patient age, level of education and cancer type, but not gender. This educational pattern is clinically relevant. Higher education was associated with better adherence and QoL, possibly due to better health literacy, understanding of treatment, access to, and use of health services, and help seeking behavior. However, this hypothesis was not directly assessed in the study and this should not be interpreted as a causal relationship.

4.4 Correlation between treatment adherence and quality of life

The primary result was the important association ($r=0.72$, $p=0.001$) between treatment adherence and QoL, with higher treatment adherence being associated with higher QoL ratings. However, this should be viewed with caution due to the cross-sectional nature of the study, and thus there is no implication of causation. Improved adherence may arise from continuity of care and symptom improvement, or may be due to people with better physical and psychological functioning being more likely to adhere.

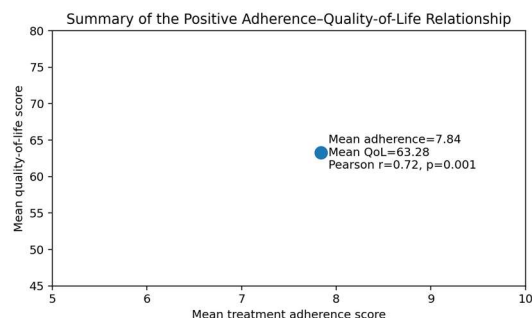


Figure 2. Summary visualization of the observed adherence-QoL relationship. The figure presents aggregate study statistics rather than individual patient-level observations.

5. Discussion

Along with supporting the association of treatment adherence and score on the QoL scale in chemotherapy patients in cancer hospitals of Bihar, this study also found that more than half of the patients had moderate adherence to treatment, and 35% had good adherence. This finding can be understood given that it is difficult to live with cancer treatment due to the interrelatedness of toxicities, psychological issues, logistic issues, and other life activities. This is in line with Jacobs et al. (2019) that identified symptom burden as a major factor of the oral chemotherapy experience. Systematic reviews also identified treatment-related toxicity and psychosocial factors as meaningful contributors to adherence (Greer et al., 2016; Verbrugge et al., 2013; Rashidi et al., 2024).

Assessment of Treatment Adherence and Its Association with Quality of Life among Cancer Patients Undergoing Chemotherapy at Selected Cancer Hospitals in Bihar

A finding of moderate QoL is clinically plausible, since chemotherapy may impact upon a number of factors: particularly physical functioning, energy level, appetite, sleep, emotional state and social functioning. Consequently, published mean QoL values, such as those reported in the present study of 63.28 ± 11.46 , should be interpreted within the constraints of the particular scoring schema used. As the EORTC QLQ-C30 is a multidimensional questionnaire, reporting at the level of domains would provide more detailed information regarding the functional and symptom burden (Fayers et al., 2001).

Adherence and QoL were considerably related to age, possibly reflecting the different impact of comorbidity, caregiving, work, mobility, treatment and dependency on family support across age categories. As education influenced both adherence and QoL, this may indicate that health communication and treatment literacy are necessary for adherence. Oncology nurses cannot assume that the information they provide during consultations has been fully understood by their patients, and must ensure that information is tailored, repeated with each cycle, and supplemented by provision of written or pictorial materials.

Occupation was also considerably associated with adherence and QoL. Employment might represent financial resources, greater integration in society, and, on the other hand, scheduling and work-related stressors. Unemployed participants had worse QoL outcomes than employed participants. No outcomes were measured for household resources, insurance coverage, distance to treatment, treatment costs, or workplace support. Future research should examine these pathways rather than solely treating occupational category as a direct causal determinant of QoL outcomes.

QoL has been correlated with cancer type in the source study, but cancer type has not been described as a correlate of adherence. Differences in disease state, treatment intensity, prognosis, symptom burden, and body image may impact QoL across cancer types. Further, although breast cancer patients reported considerably better QoL and lung cancer patients a greater proportion of poor QoL, this should be interpreted with caution because stage, treatment regimen, performance status and the presence of comorbidity were not included in the analyses.

As the strongest correlation was between adherence and QoL, results support literature reporting associations between adherence, symptom control, psychosocial support, and better patient-reported outcomes (Antol et al., 2018; Puspitasari et al., 2024; Fujii et al., 2022). In nursing practice, adherence assessment should be coupled with symptom assessment and not seen as a punitive judgement of patient behavior. Missed appointments, delayed presentation, and poor adherence may indicate toxicity, distress, financial difficulties, low health literacy, or poor accessibility to health services.

These findings support the patient-centered model of adherence. In this model, nurses routinely ask patients about specific barriers to treatment, and treatment-related symptoms, reinforce the rationale and timing of treatment, involve the family (with patient consent), and refer patients if psychological, social or financial barriers to treatment are suspected. International nursing evidence supports education and follow-up as core components of anticancer treatment (Kav et al., 2008). Thus, structured supportive monitoring might be particularly useful for the patients in this study classified as having lower adherence and low QoL.

6. Implications for Nursing Practice and Oncology Services

On the basis of our results we recommend that, firstly, clinical nurses assess patients' adherence in each chemotherapy contact, by a short, non-judgemental interview on missed dose, cycle delay, attendance to follow-up and difficulty following treatment instructions. Secondly, active management of nausea, fatigue, pain, mucositis, appetite disturbance and psychological distress is necessary to avoid treatment interruption because of symptom exacerbation. Third, education should be adjusted to the literacy and language-level of the patient and reinforced by teach-back. Fourth, poor QoL or repeated adherence-related problems should lead to screening for psychological distress, social support and practical barriers.

At service level, nurse-led follow-up services, telephone reminders, symptom triage services and counselling may support continuity of care. Recording barriers to adherence may help multidisciplinary teams distinguish between intentional non-adherence and non-adherence consisting of toxicity, failure to access the medication, or misunderstanding. The strong associations with education and occupation also support the contention that supportive strategies should be responsive to social context rather than be delivered generically.

7. Strengths and Limitations

Assessment of Treatment Adherence and Its Association with Quality of Life among Cancer Patients Undergoing Chemotherapy at Selected Cancer Hospitals in Bihar

For example, a strength of this study was the examination of both treatment compliance and HRQoL within the same sample of 200 cancer patients receiving chemotherapy, which eased the exploration of the relationship between compliance and HRQoL as well as the demographic variables associated with these variables. The use of a well-known cancer-specific HRQoL questionnaire also increased the clinical relevance of this study. Several limitations should also be mentioned. The purposive, non-probability sample came from selected hospitals. Cross-sectional design precludes causal inference on whether adherence increases QoL or vice versa, or whether confounding is at work. Ability to self-report may be influenced by recall bias and social desirability bias. Patient-level data, sample-specific instrument reliability coefficients, adherence-scale identification and cut-off derivation, stage of cancer, chemotherapy regimen used, comorbidity, and domain-specific QLQ-C30 scores are not provided. These data may be reported prior to submission to the journal if available. In addition, the article states, these two groups of 100 patients comprised the study sample, but the study sample is described as one cross-sectional cohort of 200 patients. Therefore, this article reports only the total sample of 200 patients and does not describe a control group.

8. Conclusion

This study concluded that among 200 cancer patients undergoing chemotherapy in Rajendra Memorial Research Institute of Medical Sciences and other selected cancer hospitals of Bihar, moderate adherence and moderate QoL were most common and the association between treatment adherence and age, education and occupation, and QoL and age, education, occupation, and cancer type was meaningful. Adherence was found to be considerably positively correlated with better QoL ($r=0.72$, $p=0.001$). These findings indicate that adherence is an important and relevant component of thorough oncology care. Adherence challenges should be framed in relation to symptom burden, psychosocial distress, health literacy, and access to resources. For example, routine assessment by a triage oncology nurse, tailored education, symptom management, and supportive follow-up may help patients remain adherent to cancer treatment and maintain a good quality of life during chemotherapy.

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Assessment of Treatment Adherence and Its Association with Quality of Life among Cancer Patients Undergoing
Chemotherapy at Selected Cancer Hospitals in Bihar

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