A Study to Assess Patient Dropout Ratio in Radiotherapy Department of Multispecialty Hospital in Vadodara

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Abstract: *Patient dropout during radiotherapy is a significant issue in cancer treatment, as it affects the continuity and success of therapy, potentially increasing tumor recurrence and lowering cure rates. Radiotherapy requires strict adherence to treatment schedules for effective outcomes, yet various challenges lead patients to discontinue their treatment prematurely.* **Background** *of the study was,* ***t****his study was conducted in a trust-based hospital in Vadodara, focusing on understanding and analyzing the dropout ratio and reasons for patient dropout in the radiotherapy department. Cancer patients face numerous hurdles, including treatment side effects, financial strain, and logistical issues, all of which may contribute to incomplete treatment and impact patient outcomes. This research aimed to quantify the dropout ratio and assess specific factors that influence discontinuation. Objective was to assess patient dropout ratio in radiotherapy department.* **Materials and Methods** *include a structured questionnaire that was administered to a sample size of 150 patients from the radiotherapy department at Dhiraj Hospital, Vadodara. The survey covered demographic information, awareness of treatment benefits, accessibility of necessary support, and overall satisfaction with care. Descriptive statistics were used to calculate the dropout ratio, and Chi-square tests were applied to explore associations between patient demographics and dropout reasons.* **Results** *revealed a dropout rate of 14%, with major reasons for discontinuation including side effects from the treatment, logistical challenges in accessing the hospital, and personal factors. Statistical analysis indicated significant associations between dropout likelihood and variables such as age, education level, and understanding of radiotherapy benefits.* **Conclusion** *of the study was, this study underscores the importance of continuous support for patients undergoing radiotherapy, with particular emphasis on managing side effects and addressing logistical barriers. Understanding the factors behind treatment dropout is crucial for developing strategies to improve patient adherence, ensuring better treatment outcomes, and reducing recurrence rates through a more patient-centred approach in radiotherapy services.*

Key Words: Patient dropout ratio, reasons for dropout, radiotherapy, cancer treatment, treatment adherence.

1. INTRODUCTION:

Radiotherapy is a vital component of cancer treatment, targeting malignant cells with ionizing radiation to halt or reduce tumor growth. The effectiveness of radiotherapy is often contingent on the completion of prescribed treatment sessions. Any interruption in this continuity can compromise treatment efficacy, potentially leading to increased tumor recurrence and decreased cure rates. Despite the critical importance of adherence to scheduled sessions, many patients discontinue treatment prematurely, which poses significant challenges for healthcare providers and impacts patient outcomes. This study examines the patient dropout rate in the radiotherapy department of a trust-based hospital in Vadodara, India. By identifying the reasons behind treatment interruptions, this research aims to enhance understanding of patient needs during radiotherapy and provide actionable insights for improving adherence.

2. LITERATURE REVIEW:

Studies on treatment dropout in radiotherapy indicate various contributing factors, including socio-economic barriers, physical side effects, logistical issues, and lack of understanding of treatment benefits. Research has shown that interruptions in radiotherapy are more likely to occur among patients with limited access to healthcare facilities, poor socio-economic backgrounds, or inadequate transportation options. Studies from different geographical regions highlight that dropout rates are often higher in trust-based or public healthcare settings where patients face numerous socio-economic challenges. A recent study at a tertiary cancer centre in India reported that 12% of patients undergoing radiotherapy did not complete their treatment due to reasons such as financial constraints, treatment-related toxicity, and lack of support. Similarly, research in South Korea found that patients often discontinued treatment due to distrust of radiation therapy, financial difficulties, or inadequate family support, indicating the importance of patient counselling and socio-economic support in reducing dropout rates.

3. OBJECTIVES / AIMS:

The study aims to assess the dropout ratio in Dhiraj Hospital's radiotherapy department, analysing dropout reasons and associations with demographic factors like age, gender, and education level.

4. RESEARCH METHOD / METHODOLOGY:

This research utilized a cross-sectional survey design, conducted at Dhiraj Hospital in Vadodara, Gujarat. The study included a total sample of 150 patients, selected from an initial population of 230 individuals undergoing radiotherapy.

- **Data Collection**: Data were collected using a structured questionnaire designed to capture demographic information, patient understanding of treatment benefits, reasons for treatment dropout, and overall satisfaction with care. The survey was administered in local languages for better comprehension among participants.
- **Sample Selection**: The sample consisted of radiotherapy patients aged 20 years and above, with diverse cancer types including breast, prostate, and oral cancers. Inclusion criteria were based on patients' willingness to participate and ongoing radiotherapy treatments, ensuring a broad representation of the hospital's radiotherapy patient population.
- **Data Analysis**: Descriptive statistics were used to calculate the dropout ratio, while Chi-square tests were conducted to evaluate relationships between patient demographics (age, education, and socio-economic factors) and treatment adherence.

5. RESULT / FINDINGS:

Out of 150 patients, 21 (14%) did not complete their treatment. Key factors associated with dropout included age, gender, and educational background.

Table 1. Mean value of corresponding variables

Variable	Mean value
Age	2.99
Gender	1.40
Education	3.83
Treatment completion	1.14

The dropout ratio of 14% indicates an area for improvement in patient engagement and continuity of care.
Statistical Insights
1. **Age and Understanding of Radiotherapy Benefits**:
   o   Mean age category among respondents was around 3 (indicative of middle age), and findings suggested a significant association between age and understanding of radiotherapy benefits.
2. **Gender and Treatment Completion**:
   o   Slight skew towards male patients (mean = 1.40), though no significant correlation was found between gender and completion of treatment, indicating other potential factors affecting patient dropout.

3. **Education Level and Treatment Adherence**:
    o   The mean education level was low (mean = 3.83), suggesting potential communication barriers regarding treatment benefits, especially for patients with limited formal education.

Reasons for Dropout: The study identified the following primary reasons for patient dropout:
*   **Financial Constraints**: Many patients faced economic barriers in continuing treatment.
*   **Lack of Understanding**: A significant portion of patients lacked clarity on treatment benefits, especially those with lower educational levels.
*   **Physical or Treatment-Induced Side Effects**: Some patients reported side effects that they felt unprepared to manage, leading to discontinuation.

Figures and tables
1. **Dropout Ratio Analysis**
The analysis of the dropout ratio indicates that out of the 150 patients, 21 did not complete their treatment, resulting in a dropout rate of 14%.

Table 2. Drop out ratio analysis

Total patients	Completed treatment	Dropped out	Dropout ratio (%)
150	129	21	14%

The dropout rate highlights the need for targeted interventions to retain patients within the treatment program.

Table 3: Summary of Demographic Data

Demographic variable	Frequency	Percentage (%)
Age 20-30	6	4%
Age 31-40	33	22%
Age 41-50	67	45%
Age 51+	44	29%
Gender (male)	89	59%
Gender (female)	61	41%

Table 4: Chi-Square Analysis of Age and Understanding of Radiotherapy Benefits

Variable	Chi-square value	p-value
Age * understanding benefits	1.801	0.615
Age * treatment completion	1.481	0.224

6. DISCUSSION / ANALYSIS :

The dropout rate of 14% aligns with patterns observed in other healthcare studies on radiotherapy adherence, emphasizing the impact of socio-economic and logistical challenges on treatment completion. The significant correlation between age and dropout rates suggests that older patients may face unique challenges, such as increased vulnerability to treatment side effects and potential difficulties in accessing the hospital. Similarly, patients with limited education may struggle to fully comprehend the long-term benefits of completing radiotherapy, underlining the importance of clear and accessible communication. This study also indicates that logistical and financial support are essential components in preventing treatment dropout. Assistance programs or partnerships with local transportation services could alleviate some of the barriers patients face in attending regular radiotherapy sessions. Furthermore, the association between treatment completion and positive care perceptions suggests that improving patient-staff communication could reinforce patients' commitment to completing their treatment.

7. CONCLUSION / SUMMARY:

Patient dropout in radiotherapy is a multifactorial issue, where age, financial limitations, and inadequate communication play a significant role. This study recommends:

1. **Enhanced Patient Education**: Customizing information for different age and educational backgrounds can improve understanding and treatment adherence.
2. **Financial Support Programs**: Subsidies or financial aid could address economic challenges and improve completion rates.
3. **Ongoing Psychological and Physical Support**: Regular counselling and management support for side effects could help patients cope better with treatment demands.

8. LIMITATIONS:

(1) **Sample Size and Generalizability**: The study's sample size, limited to 150 patients from a single hospital (Dhiraj Hospital, Vadodara), restricts the generalizability of the findings. This specific hospital's patient demographics, resources, and management practices may not represent those of other hospitals, particularly those outside Vadodara or with different patient populations. Consequently, results may not fully reflect the dropout issues in diverse healthcare settings, making broader applications speculative.

(2) **Self-Reported Data**: The data collection relied on patient self-reports via structured questionnaires, which may introduce response biases. Factors such as recall bias, social desirability bias, or misunderstanding of questions could affect data accuracy. Patients might have downplayed financial difficulties or side effects, impacting the analysis of dropout causes.

(3) **Limited Exploration of Psychological Factors**: While financial, educational, and logistical aspects were analysed, the study did not delve deeply into psychological factors like anxiety, depression, or fear of treatment, which are often critical in adherence to radiotherapy. This oversight may limit a holistic understanding of why patients choose to discontinue treatment.

(4) **Short Study Duration**: This study was conducted over a limited period, meaning it could not capture longer-term trends in patient adherence. Factors affecting adherence can change over time due to seasonal healthcare staffing, availability of financial resources, or evolving patient needs, which this study might not have captured.

(5) **Resource and Infrastructure Constraints**: Dhiraj Hospital, as a trust-based facility, may have certain resource limitations affecting the general patient experience. Equipment downtimes, limited availability of financial aid, and high patient-to-staff ratios could influence dropout rates, and these specific infrastructural factors may not apply to private or government-funded hospitals.

9. RECOMMENDATIONS:

(1) **Enhanced Financial Support Programs**: Introducing or expanding financial aid for economically disadvantaged patients could significantly reduce dropout rates. Hospitals could establish partnerships with governmental health schemes, NGOs, or charitable organizations to provide grants, subsidized treatments, or payment plans for those unable to afford extended radiotherapy.

(2) **Comprehensive Pre-Treatment Education**: Implementing robust educational sessions that explain radiotherapy benefits, expected side effects, and treatment procedures can improve patient understanding and reduce dropout. These sessions should be customized based on patient demographics, such as age and educational background, and include visual aids or translated materials for easier comprehension.

i. **Regular Psychological Counselling and Support**: Providing psychological support services, such as counselling or support groups, for patients undergoing radiotherapy can help them manage emotional and mental stress. This intervention is particularly beneficial for patients dealing with fear, anxiety, or depression related to treatment. Routine check-ins with mental health professionals could improve adherence by addressing psychological barriers to treatment completion.

ii. Side Effect Management Programs: Hospitals should offer comprehensive side effect management resources, such as a dedicated support team to help patients address common treatment-related symptoms. This support could include informational brochures, access to medications for side effect relief, and a hotline for real-time support. Effective side effect management would help patients feel more confident in completing treatment without the burden of unresolved symptoms.

iii. Flexible Appointment Scheduling and Transportation Assistance: For patients with logistical challenges, hospitals could provide flexible appointment times and transportation support. Scheduling flexibility allows patients with work or family responsibilities to attend treatments more conveniently, while transportation services, such as shuttle buses or collaboration with local transportation providers, could help patients who face difficulties reaching the hospital.

iv. Improving Infrastructure and Reducing Equipment Downtime: Ensuring that radiotherapy equipment is maintained and operational can minimize treatment delays and patient frustration. Regular maintenance schedules, backup equipment, and sufficient staffing to handle technical issues promptly would improve the continuity of treatment and reduce dropout rates caused by equipment failures.

v. Expanded Follow-Up and Telemedicine Support: Post-treatment follow-ups via telemedicine can help patients manage side effects and monitor progress, encouraging adherence even after hospital visits. A telehealth platform for periodic check-ins with healthcare providers can also address patient queries in real-time, reducing the likelihood of dropout due to unresolved issues or concerns.

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