Evaluation of the Impact of Medication Counseling on Treatment Adherence in Oncology Patients: A Retrospective Study

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Abstract

Objective: This study aimed to evaluate the impact of medication counseling on treatment adherence among oncology patients using a retrospective analysis.

Methods: We conducted a retrospective cohort study involving 150 oncology patients, divided into two groups: those who received medication counseling (n=75) and those who did not (n=75). Data on medication adherence, including Proportion of Days Covered (PDC) and medication refill rates, were extracted from electronic health records. Multivariate regression analysis was used to assess the impact of counseling while controlling for potential confounders.

Results: Patients who received medication counseling had a significantly higher mean PDC (0.85) compared to the non-counseled group (0.77, p=0.04). Medication refill rates were also higher in the counseled group (85.4%) versus the non-counseled group (77.2%, p=0.03). Multivariate analysis confirmed that medication counseling was a significant predictor of higher adherence (p=0.02), independent of other factors such as age, gender, and treatment regimen.

Conclusion: Medication counseling is associated with improved treatment adherence among oncology patients. Integrating structured counseling into oncology care can enhance adherence and potentially improve clinical outcomes.

Keywords: Medication counseling, treatment adherence, oncology, Proportion of Days Covered, medication refill rates, retrospective study

Introduction

Treatment adherence is a critical factor in the successful management of oncology patients, significantly influencing treatment outcomes and overall survival rates (Osterberg & Blaschke, 2005). Despite the availability of advanced therapies, non-adherence to prescribed treatment regimens remains a prevalent issue in oncology, with various studies indicating that adherence rates can vary widely among patients (Horne et al., 1999).

Medication counseling is widely recognized as a key intervention to improve adherence. This approach involves providing patients with information about their medications, including how and when to take them, potential side effects, and the importance of adherence to achieve therapeutic goals (McDonald et al., 2002). Effective counseling has been shown to enhance patients' understanding of their treatment regimen, address concerns, and ultimately improve adherence rates (Brown & Bussell, 2011).

Several studies have demonstrated the positive impact of medication counseling on adherence in various patient populations, including those with chronic diseases such as diabetes and hypertension (Sabaté, 2003). However, research specifically focusing on oncology patients remains limited. Oncology patients often face unique challenges, such as complex treatment regimens, severe side effects, and the psychological burden of cancer diagnosis and treatment (Krikorian et al., 2019). These factors may influence how medication counseling impacts adherence in this population.

Given these considerations, this study aims to evaluate the impact of medication counseling on treatment adherence in oncology patients through a retrospective analysis. By examining patient records and adherence

data, this research seeks to determine whether medication counseling improves adherence rates and identifies any factors that may influence its effectiveness.

Literature Review

1. Medication Adherence in Oncology: Medication adherence is essential in oncology for achieving optimal therapeutic outcomes and improving survival rates. Adherence rates among oncology patients can be influenced by various factors, including the complexity of the treatment regimen, the presence of side effects, and psychological aspects related to the cancer diagnosis (Gruszczyńska et al., 2020). Poor adherence can lead to suboptimal treatment outcomes, disease progression, and increased healthcare costs (Conn et al., 2016).

2. Impact of Medication Counseling: Medication counseling has been identified as a crucial intervention to improve patient adherence. It involves providing patients with comprehensive information about their medications, including instructions on how to take them, potential side effects, and the importance of adherence (McDonald et al., 2002). Effective medication counseling has been shown to enhance patients' understanding of their treatment, address concerns, and increase adherence rates (Brown & Bussell, 2011).

3. Evidence of Medication Counseling in Chronic Diseases: Studies have demonstrated the benefits of medication counseling in various chronic disease populations. For example, in patients with diabetes, medication counseling has been associated with improved adherence to oral hypoglycemic agents and better glycemic control (An et al., 2013). Similarly, patients with hypertension who receive medication counseling show better adherence to antihypertensive therapies and improved blood pressure management (Shin et al., 2013).

4. Medication Counseling in Oncology: Research specifically focusing on medication counseling in oncology patients is limited but suggests promising results. In a study by Felton et al. (2016), oncology patients who received structured medication counseling showed improved adherence to oral chemotherapy regimens compared to those who did not receive counseling. Another study by Pourcelot et al. (2018) found that tailored counseling interventions significantly increased adherence rates among breast cancer patients undergoing hormone therapy.

5. Barriers to Adherence and Counseling Effectiveness: Several barriers can impact medication adherence in oncology patients, including treatment-related side effects, complex medication regimens, and psychological distress (Partridge et al., 2009). Addressing these barriers through targeted medication counseling can help improve adherence. However, the effectiveness of counseling can be influenced by factors such as the timing of the intervention, the patient's level of understanding, and the quality of the counseling provided (Schulte, 2016).

6. Gaps in the Literature: Despite the evidence supporting the role of medication counseling in improving adherence, there remains a need for further research focused on oncology patients. Specifically, studies evaluating the long-term impact of medication counseling on adherence, the effectiveness of different counseling approaches, and the role of patient-specific factors are needed to optimize counseling strategies and enhance patient outcomes.

Methodology

Study Design: This study utilized a retrospective cohort design to evaluate the impact of medication counseling on treatment adherence among oncology patients. The aim was to analyze historical data from patient records to determine whether medication counseling was associated with improved adherence to prescribed oncology treatments.

Data Sources: Patient data was obtained from electronic health records (EHRs) of a tertiary hospital specializing in oncology care. The records included information on medication counseling sessions, patient demographics, treatment regimens, and adherence rates.

Sample Selection: The study cohort comprised oncology patients who received treatment between January 2018 and December 2020.

Inclusion criteria were as follows:
- Patients diagnosed with cancer and undergoing active treatment.

- Patients who had documented records of medication counseling.
- Patients with a minimum follow-up period of 6 months.

Exclusion criteria included:
- Patients with incomplete medication records.
- Patients who received palliative care only, without active curative treatment.

A total of 300 patient records were reviewed. Of these, 150 patients met the inclusion criteria. The sample was further categorized into two groups:
1. Counseled Group (n=75): Patients who received formal medication counseling.
2. Non-Counseled Group (n=75): Patients who did not receive formal medication counseling.

Data Collection : Data on medication counseling was extracted from patient records, including the date and content of counseling sessions, and the credentials of the counselor. Information on treatment adherence was gathered by reviewing pharmacy records and patient self-reports, focusing on medication refill rates and adherence to prescribed regimens.

Variables
- **Independent Variable:** Receipt of medication counseling (yes/no).
- **Dependent Variable:** Medication adherence, measured by the proportion of days covered (PDC) and medication refill rates.
- **Covariates:** Patient age, gender, type of cancer, treatment regimen, and presence of side effects.

Data Analysis: Quantitative data were analyzed using statistical software. Descriptive statistics summarized patient demographics and adherence rates. To assess the impact of medication counseling on adherence, comparisons between the counseled and non-counseled groups were made using:
- T-tests for continuous variables (e.g., PDC).
- Chi-square tests for categorical variables (e.g., adherence rates).

Multivariate regression analysis was conducted to control for potential confounders and to evaluate the independent effect of medication counseling on adherence.

Ethical Considerations: The study was approved by the ethics committee. Patient confidentiality was maintained by de-identifying all data before analysis. Written informed consent was waived due to the retrospective nature of the study.

Findings
1. Sample Characteristics: The study analyzed data from 150 oncology patients, divided into two groups: the Counseled Group (n=75) and the Non-Counseled Group (n=75). The following table summarizes the demographic and treatment characteristics of the sample.

Table 1: Demographic and Treatment Characteristics of the Study Sample

Characteristic	Counseled Group (n=75)	Non-Counseled Group (n=75)	p-value
Age (Mean ±SD)	62.5 ±10.4	63.2 ±11.1	0.68
Gender			
Male	40 (53.3%)	42 (56.0%)	0.73
Female	35 (46.7%)	33 (44.0%)	
Type of Cancer			
Breast	20 (26.7%)	18 (24.0%)	0.65
Lung	15 (20.0%)	14 (18.7%)	0.78
Prostate	12 (16.0%)	11 (14.7%)	0.82

Other	28 (37.3%)	32 (42.7%)	0.52
Treatment Regimen			
Chemotherapy	45 (60.0%)	46 (61.3%)	0.88
Targeted Therapy	20 (26.7%)	19 (25.3%)	0.87
Hormone Therapy	10 (13.3%)	10 (13.4%)	0.99

2. Adherence Rates: Adherence rates were measured by the Proportion of Days Covered (PDC) and medication refill rates. The following tables present the findings for these measures.

Table 2: Proportion of Days Covered (PDC) by Group

Group	PDC (Mean ±SD)	p-value
Counseled Group	0.85 ±0.12	0.04
Non-Counseled Group	0.77 ±0.15	

Table 3: Medication Refill Rates by Group

Group	Refill Rate (%)	p-value
Counseled Group	85.4%	0.03
Non-Counseled Group	77.2%	

3. Impact of Medication Counseling: The data indicates a significant difference in adherence rates between the counseled and non-counseled groups. Patients who received medication counseling had higher PDC and refill rates compared to those who did not receive counseling.

4. Multivariate Analysis: Multivariate regression analysis was performed to control for confounding factors such as age, gender, type of cancer, and treatment regimen. The results showed that medication counseling remained a significant predictor of higher adherence rates ($p < 0.05$).

Table 4: Multivariate Regression Analysis of Adherence

Variable	Coefficient	Standard Error	p-value
Medication Counseling	0.15	0.07	0.02
Age	-0.01	0.01	0.32
Gender (Female)	-0.05	0.06	0.40
Type of Cancer	0.03	0.05	0.55
Treatment Regimen	0.08	0.05	0.14

The findings demonstrate that medication counseling has a positive impact on treatment adherence among oncology patients, as evidenced by higher adherence rates in the counseled group compared to the non-counseled group.

Discussion
This study evaluated the impact of medication counseling on treatment adherence in oncology patients using a retrospective analysis. The findings demonstrate that medication counseling significantly improves adherence rates, as evidenced by higher Proportion of Days Covered (PDC) and medication refill rates in patients who received counseling compared to those who did not.

1. Impact of Medication Counseling: The results align with previous research indicating that medication counseling can enhance adherence. The counseled group had a mean PDC of 0.85 compared to 0.77 in the non-counseled group, and refill rates were 85.4% versus 77.2%, respectively. This suggests that medication

counseling is effective in increasing adherence, which is crucial in oncology where adherence to complex treatment regimens is critical for achieving desired therapeutic outcomes (Horne et al., 1999; Brown & Bussell, 2011).

2. Multivariate Analysis: The multivariate regression analysis confirmed that medication counseling was a significant predictor of higher adherence rates, even when controlling for factors such as age, gender, type of cancer, and treatment regimen. This reinforces the importance of medication counseling as an independent factor contributing to improved adherence, beyond other demographic and clinical variables (McDonald et al., 2002; Krikorian et al., 2019).

3. Comparison with Previous Studies: The study's findings are consistent with those of Felton et al. (2016), who reported improved adherence among oncology patients receiving structured medication counseling. Similarly, Pourcelot et al. (2018) found that tailored counseling interventions increased adherence to hormone therapy in breast cancer patients. These studies support the effectiveness of counseling interventions in oncology and underscore the need for integrating such practices into routine care.

4. Barriers and Facilitators: Several barriers to adherence were identified, including the complexity of treatment regimens and side effects (Partridge et al., 2009). Medication counseling addresses these barriers by providing patients with essential information and support, which can help mitigate the challenges associated with adhering to oncology treatments. However, the effectiveness of counseling can vary based on factors such as the quality of the counseling provided and the timing of the intervention (Schulte, 2016).

5. Clinical Implications: The study highlights the need for healthcare systems to prioritize medication counseling as part of oncology care. Implementing structured counseling programs and training healthcare providers to deliver effective counseling can improve patient outcomes and adherence rates. Future research should explore the optimal timing and content of counseling interventions to maximize their impact on adherence.

6. Limitations and Future Research: This study's limitations include its retrospective design and reliance on EHR data, which may have incomplete or inaccurate records. Additionally, the observational nature of the study precludes causal inferences. Future research should employ prospective designs and consider patient-reported outcomes to provide a more comprehensive understanding of the impact of medication counseling. In conclusion, medication counseling is a valuable intervention for improving treatment adherence among oncology patients. By enhancing patients' understanding of their treatment regimens and addressing adherence barriers, medication counseling can play a critical role in optimizing oncology care and improving patient outcomes.

References
1. An, J., & Nichol, M. B. (2013). Multiple medication adherence and its effect on clinical outcomes among patients with comorbid type 2 diabetes and hypertension. *Medical care*, *51*(10), 879-887.
2. Brown, M. T., & Bussell, J. K. (2011, April). Medication adherence: WHO cares?. In *Mayo clinic proceedings* (Vol. 86, No. 4, pp. 304-314). Elsevier.
3. Conn, V. S., Ruppar, T. M., Rn, M. E., & Cooper, P. S. (2016). Patient-centered outcomes of medication adherence interventions: systematic review and meta-analysis. *Value in Health*, *19*(2), 277-285.
4. Felton, M. A., Van Londen, G. J., & Marcum, Z. A. (2016). Medication adherence to oral cancer therapy: the promising role of the pharmacist. *Journal of Oncology Pharmacy Practice*, *22*(2), 378-381.
5. Gruszczyńska, M., Bąk-Sosnowska, M., & Szemik, S. (2020). Selected psychological aspects and medication adherence in oncological patients. *Cancer Medicine*, *9*(3), 943-950.

6. Horne, R., Weinman, J., & Hankins, M. (1999). The beliefs about medicines questionnaire: the development and evaluation of a new method for assessing the cognitive representation of medication. *Psychology and health*, *14*(1), 1-24.

7. Krikorian, S., Pories, S., Tataronis, G., Caughey, T., Chervinsky, K., Lotz, M., ... & Weissmann, L. (2019). Adherence to oral chemotherapy: Challenges and opportunities. *Journal of oncology pharmacy practice*, *25*(7), 1590-1598.

8. McDonald, H. P., Garg, A. X., & Haynes, R. B. (2002). Interventions to enhance patient adherence to medication prescriptions: scientific review. *Jama*, *288*(22), 2868-2879.

9. Osterberg, L., & Blaschke, T. (2005). Adherence to medication. *New England journal of medicine*, *353*(5), 487-497.

10. Partridge, A. H., Kato, P. M., & DeMichele, A. (2009). Adherence to oral cancer therapies: challenges and opportunities. In *American Society of Clinical Oncology* (pp. 124-128).

11. Pourcelot, C., Orillard, E., Nallet, G., Dirand, C., Billion-Rey, F., Barbier, G., ... & Nerich, V. (2018). Adjuvant hormonal therapy for early breast cancer: an epidemiologic study of medication adherence. *Breast Cancer Research and Treatment*, *169*, 153-162.

12. Sabaté, E. (Ed.). (2003). *Adherence to long-term therapies: evidence for action*. World Health Organization.

13. Schulte, B. (2016). Patient Education and Medication Adherence.

14. Shin, S., Song, H., Oh, S. K., Choi, K. E., Kim, H., & Jang, S. (2013). Effect of antihypertensive medication adherence on hospitalization for cardiovascular disease and mortality in hypertensive patients. *Hypertension Research*, *36*(11), 1000-1005.