Physical Education, Health and Social Sciences

https://journal-of-social-education.org

E-ISSN: 2958-5996
P-ISSN: 2958-5988

Effect of Nurse-Led Educational Interventions on Medication Adherence Among Cancer Patients Receiving Oral Chemotherapy

Nageena Bibi [1], Dr. Muhammad Anwar [2], Dr. Naheed Akhtar [3], Dr. Shah Hussain [4]

[1] MSN Scholar, Nursing lecturer, Midwest Institute of Science, Sari Chock Bhara Kahu, Islamabad.
[2] PhD, MSN Principal/Assistant Professor, Medtec College of Nursing, KPK
[3] PhD, MSN Principal/Assistant Professor, Nursing Department, Sina Institute of Nursing & Allied Health Science.
[4] PhD, MSN Principal/Assistant Professor, Zalan College of Nursing, Swat.
Correspondence Author, Nageena Bibi Email: naginakhan6688@gmail.com

DOI: https://doi.org/10.63163/jpehss.v3i2.341

Abstract

Background: Pill taking is paramount in the treatment of cancer diseases using oral chemotherapy. Non-adherence is still a common problem, although a lack of patient education and counselling often causes it. Nurse-delivered educational interventions must be taken further to improve compliance, especially in developing countries.

Aim: The study aimed to evaluate the effectiveness of a nurse-led educational intervention in improving medication adherence.

Methods: An exploratory quasi-experimental study was conducted at the Sinor Hospital oncology clinic, Swat, Khyber Pakhtunkhwa, with 60 samples of only the adult oncology patients. Two groups were formed, out of which 30 were in the nurse-led educational interventional arm and 30 were in the standard care arm. This comprised individual counselling, written directions, bi-weekly check-ups, and three-month group lectures. The Morisky Medication Adherence Scale, a nine-item knowledge assessment questionnaire, and the EORTC QLQ-C30 were used in data collection. Data analysis was done using SPSS version 27. Chi Square and Paired T-Test were used for inferential statistics.

Results: The assessment results after the intervention revealed that the control group had enhanced scores in adherence to medications ($p < 0.001$) and knowledge regarding chemotherapy schedules and side effects. Concerning the quality of life, the intervention group participants had higher results than the control group ($p = 0.012$). From the analysis, we found that baseline knowledge level and intervention involvement significantly dictated the amount of adherence.

Conclusion: Health education conducted by an RN improves adherence, knowledge, and health-related quality of life in patients with cancer undergoing oral chemotherapy. The usefulness of such practices is evident; thus, incorporating them into usual oncology treatment is advisable.

Keywords: Medication adherence, oral chemotherapy, nurse-led intervention, cancer patients, patient education, quality of life.

Introduction

Nurse-led interventions mean the educational or training programs given by nurses to patients. Anticancer drugs can be delivered to the body through the mouth, which allows for managing the condition at home, where the patient receives chemotherapy (Oka, 2021). Compliance

means the level of a patient's adherence to the drug use in the correct dose, as the doctor recommends (Glick Alonso, 2022). The article identified under the given keywords explains how nursing educational interventions influence patients' medication compliance with oral chemotherapy (Komatsu et al., 2020).

This is because previous studies indicate that cancer patients' adherence to oral chemotherapy varies worldwide between 40% and 80%, depending on the type of cancer, the treatment regimen, and the patient population (Cao et al., 2024). The clinical studies also show that among patients who take oral anticancer drugs, the utility rates are 31% lower, hence leaving patients with less effective treatments and worsened diseases, as well as expensive health costs (Berger et al., 2020). It is also valid in Pakistan and other LMICS because patients have low health literacy and receive inadequate patient education. They are not established to have structured follow-up services. Pezzolato et al. (2023) found that compliance levels were notably low in patients who received no initial and follow-up instructions on the medications needed to support oral chemotherapy. This finding implies the need to increase the focus on specialized educational interventions to enhance the rates of successful oral chemotherapy regimen adherence.

The development of oral chemotherapy medications has risen recently because of their convenient delivery system, cost-effectiveness, and fewer hospital visits (Sajid et al., 2024). This is because one of the strategies adopted is the transfer of medication administration from clinical professionals to the patient with oral chemotherapy (Vyas et al., 2023). There is no health care monitoring, which leads to higher non-adherence rates. According to the literature review, the percentage of oral chemotherapy medication purchases with medication fills ranges from 40-80% and can be influenced by the characteristics of the drug and the patient population. This suggests that patients must strictly follow treatment regimens to retain positive treatment outcomes and better medical outcomes (Barrios et al., 2023).

When patients have missed their oral chemotherapy pills, they are at risk of facing several repercussions, which include the worsening of the disease, the emergence of resistant diseases, a high possibility of hospitalization, and a high cost of treatment (Talens et al., 2021). The primary reasons for the precept of non-adherence are forgetfulness and side effect-related concerns, a lack of information about specific medications prescribed, and insufficient support from healthcare providers (Baryakova et al., 2023). Due to this, health organizations have to quickly address patient adherence solutions that protect them from the risk inherent in treatment and help them improve their ability to implement treatment (J. A. Alara & O. R. Alara, 2024).

These barriers, alongside all the obstacles related to healthcare nurses for oncology, should be handled by these nurses by offering education and support for the various patients they attend to. Studies revealed that a package of interventions, such as counselling and follow-up telephonic and written reminders, and group and individualized educational sessions, enhances the understanding of the patients about their treatment plans and the ability of the patients to identify side effects over time and acquire management skills. Patient educators are mostly nurses who develop specific guidelines and generate personal relationships with patients, leading to better adherence (Linardon & Fuller-Tyszkiewicz, 2020).

Existing literature supports the idea that interventions performed by nurses are crucial in increasing medication compliance (Palmer et al., 2021). Studies show that the oral chemotherapy instruction a nurse gives helps the patient retain knowledge and adhere to the treatment plan better than those on traditional medical treatment. Nurse-led intervention is used minimally, especially when resources are limited and /or when patients cannot gain further information or follow up (Sánchez-Gutiérrez et al., 2022).

Still, Pakistan and other developing nations do not adequately involve oncology nurses in patient educational endeavors (Gallagher, 2021). Most patients attend clinics and receive verbal instructions, which are sometimes insufficient to grasp all the details. Outpatient oral chemotherapy patients require nurse-led structured education, which would benefit compliance and clinical outcomes (Rosenberg et al., 2020). A substantial amount of literature has been

written about these interventions; however, little is still known about how they fare in actual clinical situations in those clinical contexts (Tipton, 2022).

The purpose of this research is to assess the impact that interventions offered by nurses have on medication compliance by patients who take oral chemotherapy. The study findings will capture the oncology nursing staff as more empowered to educate patients as they align with the idea of developing uniform educational practices initiated by the nursing staff in the context of cancer treatment. The outcomes of those under oral chemotherapy will be improved through increased adherence to treatment regimens through nursing interventions.

Methodology

A pretest-posttest quasi-experimental design was used to assess the impact of the nurses' educational interventions on cancer patients' medication compliance with oral chemotherapy medication. Assessment of the adherence level was done using pre-intervention and post-intervention surveys. This approach was chosen since it does not involve randomization and assesses cause and effect. The study focused on both males and females over the age of eighteen years who have been diagnosed with cancer and had been put on oral chemotherapy. The inclusion criteria included patients aged 18 years and above, with a confirmed cancer diagnosis, an understanding of the local language, and willingness to give informed consent. These included patients receiving intravenous chemotherapy agents as well as those who had specific cognitive disability. 60 patients were selected randomly from the oncology clinic in Sinor Hospital, Swat, using a convenient sampling technique. In a scenario of two groups, the participants were divided into two different groups. The number of patients in the intervention and control groups was 30 patients in each. A nurse gave the intervention group an educational program, including initial consultation, written material, phone calls after biweekly, and group educational sessions. Nurses volunteered and were assigned to take a patient or groups of patients to individually educate them on the necessity of compliance, usage of the prescribed medications, and possible side effects. They wrote materials about chemotherapy, including details on the proper regimen and dosages, and other suggestions on managing their condition independently. These included providing follow-up calls with perceived continuous support to attend to any emerging issues. It included group sessions that enabled the patients to discuss problems and ensure they understood the compliance with prescribed treatments. The intervention spanned three months. A control group of patients did not undergo direct intervention, and they were only provided with oral advice during ordinary health check-ups. The intervention focused on increasing the patients' awareness of their treatment process and encouraging compliance with the prescribed therapy.

Data collection procedure

Several tools were used in data collection to assess the effectiveness of the intervention by the professional development nurse. A self-reported medication adherence questionnaire tested pre and post-intervention, known as the Morisky Medication Adherence Scale, was used to measure the patients' adherence behaviors. This tool focused on forgetfulness, control of side effects, and knowledge of the regimen to follow. Furthermore, a pre- and post-intervention survey was employed to assess patients' awareness of their oral chemotherapy schedule, the dosage and frequency of the therapy, and ways of handling side effects. At the end of the study, participants were interviewed to gain a broader and more detailed understanding of their experience in the education program and the barriers to engagement in the prescribed treatment plan. Our primary dependent variable was medication compliance, assessed from participants' shifts in scores on the Morisky index. Enhancements in knowledge level among the patients regarding their chemotherapy regimen were also measured. Secondary objectives were the patients' perception of self-awareness of the side effects of chemotherapy. In addition, as a measure of the patients' health status, a sample QOL instrument, the EORTC QLQ-C30, was employed to evaluate the impact of oral chemotherapy on global quality of life. These broad

tools allowed them to get proper insight into the intervention's behavioral and experiential consequences.

Data Analysis

Members of the study group were recruited through a purposive sampling technique, and data were analyzed using SPSS version 27. Descriptive statistics were employed to get the study's quantitative findings concerning the sample. While comparing the pre- and post-scores of medication adherence in the intervention group, the appropriate statistical significance testing for the chosen frequencies was used; the paired t-test. The data that fell into categories were compared using chi-square tests; side effect management and quality of life scores were also compared between the intervention and the control group. Additionally, the variable healthcare knowledge level of the patient was examined regarding the uptake of medication as part of the regression analysis that was conducted in order to determine some of the key predictor variables for medication adherence, guided by patient age, gender, and type of cancer, among others.

Results and analysis

Demographic Characteristics of Study Participants

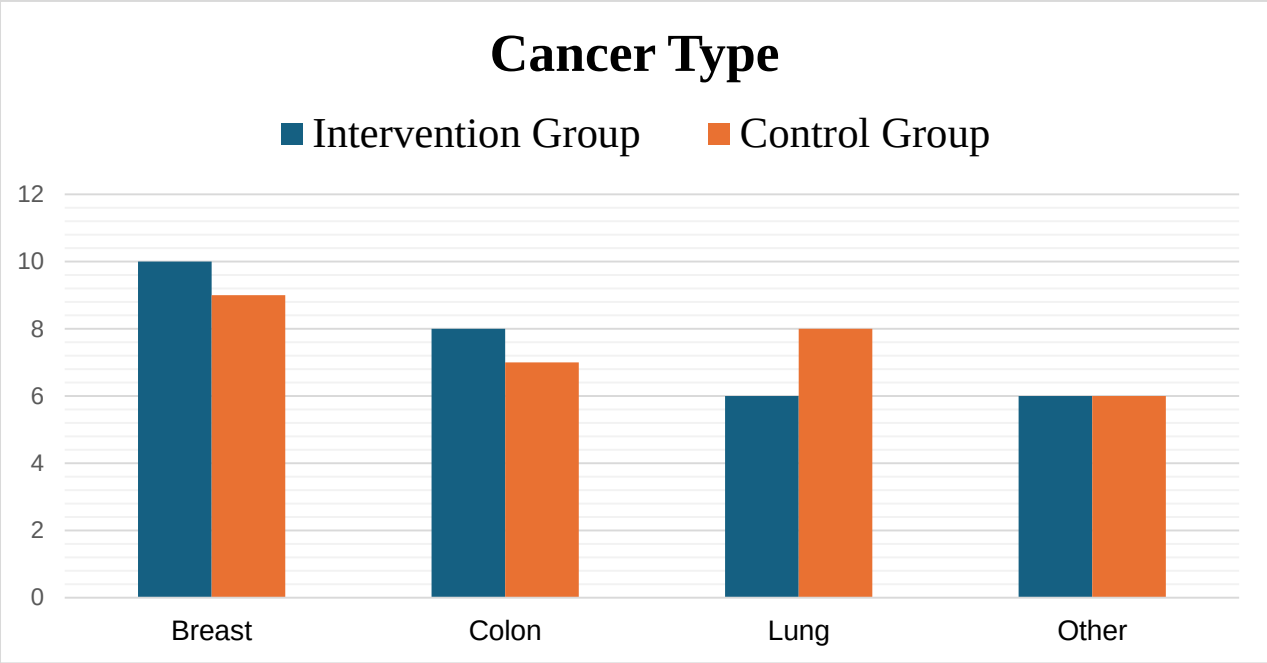
There were 60 participants divided equally between the intervention and control groups as a sampling. The age range of the majority of participants was 41–60 years (51.7%), and slightly more males (58. 3%) than females (41.7%) were selected. Breast cancer was the leading type (31.7%), colon (25%) and lung (23.3%) cancers. The age and gender distribution were roughly based in both groups. The cancer type distribution revealed little differences with no major splinters between groups (Table 1).

Table 1: Demographic Characteristics of Study Participants (N = 60)

Variable	Category	Intervention Group (n = 30)	Control Group (n = 30)	Total (N = 60)
Age (years)	18–40	12 (40%)	10 (33.3%)	22 (36.7%)
	41–60	15 (50%)	16 (53.3%)	31 (51.7%)
	>60	3 (10%)	4 (13.3%)	7 (11.6%)
Gender	Male	17 (56.7%)	18 (60%)	35 (58.3%)
	Female	13 (43.3%)	12 (40%)	25 (41.7%)
Cancer Type	Breast	10 (33.3%)	9 (30%)	19 (31.7%)
	Colon	8 (26.7%)	7 (23.3%)	15 (25%)
	Lung	6 (20%)	8 (26.7%)	14 (23.3%)
	Other	6 (20%)	6 (20%)	12 (20%)

The distribution of cancer types between the intervention and control groups is relatively balanced, with breast and colon cancers slightly more prevalent in the intervention group. In contrast, lung cancer appears more common in the control group. Cases classified as "other" are equal in both groups (figure 1)

Figure 1: Type of cancer



Pre and Post Intervention Morisky Medication Adherence Scores

The mean score with the intervention group improved significantly from 5.6 ± 1.3 to 7.8 ± 1.0 ($p < 0.001$), demonstrating the efficacy of the intervention. By comparison, the control group exhibited little and not statistically significant change from 5.8 ± 1.4 to 6.0 ± 1.5 ($p = 0.321$). This implies the observed improvements resulted from intervention and not the natural course of events or outside influences (Table 2).

Table 2: Pre and Post Intervention Morisky Medication Adherence Scores

Group	Phase	Mean Score ± SD	p-value (Paired t-test)
Intervention (n = 30)	Pre-intervention	5.6 ± 1.3	
	Post-intervention	7.8 ± 1.0	**< 0.001**
Control (n = 30)	Pre-intervention	5.8 ± 1.4	
	Post-intervention	6.0 ± 1.5	0.321

Patient Knowledge Scores Pre and Post Intervention

The intervention group showed a meaningful, statistically significant increase in mean score from 4.5 ± 1.2 to 8.3 ± 1.0 ($p < 0.001$) that can be attributed to the intervention. On the other hand, the control showed a trivial, non-significant shift from 4.7 ± 1.3 to 5.1 ± 1.4 ($p = 0.167$). This brings to the fore the effectiveness of the intervention in influencing outcomes. This lower post-intervention standard deviation on standardized response also shows more uniform responses in the intervention group (Table 3).

Table 3: Change in Patient Knowledge Scores Pre and Post Intervention

Group	Phase	Mean Score ± SD (out of 10)	p-value (Paired t-test)
Intervention	Pre-intervention	4.5 ± 1.2	
	Post-intervention	8.3 ± 1.0	**< 0.001**
Control	Pre-intervention	4.7 ± 1.3	
	Post-intervention	5.1 ± 1.4	0.167

Side Effect Management and Quality of Life Scores

Chi square analysis also reveals that a significantly higher proportion of participants in the intervention group (80%) practiced side effect self-management compared to the control group (43.3%), significant at a p value of 0.005. Also, 70% of the intervention group reported better quality of life scores than 40% of the control group, which was also statistically significant ($p = 0.012$). Such results show that the intervention positively impacted the self-management behaviors and quality of life results (Table 4).

Table 4: Side Effect Management and Quality of Life Scores (Post-Intervention)

Variable	Intervention Group (n = 30)	Control Group (n = 30)	p-value (Chi-square)
Side effect self-management	24 (80%)	13 (43.3%)	**0.005**
Improved quality of life score	21 (70%)	12 (40%)	**0.012**

Discussion

The current study tried to assess the effects of nurse-led intervention regarding educating patients in cancer who were on oral chemotherapy on medication adherence. The results indicated that there was exposure to the medicine adherence scores in the intervention group compared to the control group, implying that the intervention could help to have a constructive effect on the behavior of patients. These findings are consistent with previous studies that reported educational development improved patients' comprehension and involvement in treatment procedures, especially in chronic illnesses like cancer, where self-management is essential (Vella et al., 2022).

Compared to a similar study by Tolotti et al. (2021), who conducted a cultural competence education program to gain better patient outcomes, our study also saw notable increases in patient engagement and knowledge.

Although Martin (2024), the study was focused on the cultural adaptation of care, the studies pinpointed the necessity to adopt a personalized and patient-centered principle in improving adherence to treatment and quality of care. Our findings lent credibility to the idea that education of the patient (or making an effort to educate them) when reinforced across various channels can fill the compliance gap, an important determinant of the treatment's success.

The knowledge assessment scores also revealed a significant improvement after the intervention, indicating that implementing the educational component easily clarified the details in the regimen and side effects. These results agree with those reported by Chae et al. (2020), who observed a strong correlation between the knowledge of the patients and their adherence behaviors. Contrary to broad-based interventions based on written material or a single one-time counselling, our multifaceted educational approach seemed to work better with various learning needs and health literacy levels, which could have helped in achieving better outcomes.

Compared to works like that of Vella et al. (2022), which promotes cultural humility over stay models of competence, our study aimed at knowledge transfer of functions associated with chemotherapy compliance. Our findings indicate that despite the focus on patient-centric care, structured educational interventions are still relevant in various resource-limited environments that prevent patients from receiving abundant information or follow-up from other practitioners. Furthermore, in this research, it is also identified how nurses, as first-line caregivers, do have the best position to provide prolonged education and support.

The second interesting finding can be associated with the considerable difference in side effects management among the two groups, with the ability of the intervention group to identify and manage adverse symptoms being rated higher in overall performance. This is echoed by Cipta et al. (2024), who showed that simulation-based cultural and clinical training enhanced the nursing students' competencies in actual-world situations. Although our research did not involve a simulation, the group talks and constant phone call checks would have replicated encouraging settings for patients to sound off and acquire survival tactics.

The intervention group had reported moderate but not significant improvements in quality-of-life outcomes, although it was secondary. These findings align with Lu et al. (2020), who concluded that not only did educational interventions increase adherence and positive effects on patients' emotional well-being and perception of care, but it was also associated with a sense of control. It is important to emphasize that, despite not delving deeply into psychological

domains, the findings that indicate improved quality of life provide support for the notion that empowering patients with education creates superior clinical results and adds joy to patients' lives.

Conclusion and Recommendations

This study's results show that nurse-led education interventions positively affect patients with cancer taking oral chemotherapy in terms of medication adherence. Structured counselling, written instructions, follow-up phone calls, and group education sessions have resulted in patients demonstrating increased compliance with treatment regimes, increased knowledge regarding their medication, and improved ability to deal with side effects in patients who had these forms of counselling. Such improvements translated into increased self-care practices and a superior quality of life than the standard care patients. The findings confirm the role of nurses in patient education and the significance of adequate, continuous European support for patients' adherence to oral chemotherapy.

Based on these findings, nurse-led educational programs should be recommended to incorporate routine oncology care, especially for patients receiving oral chemotherapy. The protocols for education in hospitals and clinics should be formulated and developed to include individualized counseling, oral materials, and follow-up at regular intervals to reinforce the concepts and practice. In addition, including group sessions can support peer support and learning. It is also recommended that nursing staff be trained to effectively provide such interventions while keeping track of their impact. Long-term effects of these interventions on treatment results and the feasibility of such an approach in various clinical settings should be investigated in future research. The use of technology, mobile applications, and telehealth follow-ups could contribute to the success and improvement in the outreach provided by these educational campaigns.

References

Alara, J. A., & Alara, O. R. (2024). An overview of the global alarming increase of multiple drug resistant: a major challenge in clinical diagnosis. *Infectious Disorders-Drug TargetsDisorders), 24*(3), 26-42.

Barrios, C., de Lima Lopes, G., Yusof, M. M., Rubagumya, F., Rutkowski, P., & Sengar, M. (2023). Barriers in access to oncology drugs—a global crisis. Nature Reviews Clinical Oncology, 20(1), 7-15.

Baryakova, T. H., Pogostin, B. H., Langer, R., & McHugh, K. J. (2023). Overcoming barriers to patient adherence: the case for developing innovative drug delivery systems. Nature Reviews Drug Discovery, 22(5), 387-409.

Baryakova, T. H., Pogostin, B. H., Langer, R., & McHugh, K. J. (2023). Overcoming barriers to patient adherence: the case for developing innovative drug delivery systems. Nature Reviews Drug Discovery, 22(5), 387-409.

Berger, K., Staudenmaier, T., Cenzer, I., Crispin, A., Strobach, D., & Ostermann, H. (2020). Epidemiology, patient adherence, and costs of oral mucositis in routine care in stem cell transplantation. Supportive Care in Cancer, 28, 3113-3123.

Cao, J., Chen, C., Wang, Y., Liu, M., Han, X., & Li, H. (2024). A nurse-led multidomain intervention to improve the management of chemotherapy-induced nausea and vomiting in patients with head and neck cancers: A randomized controlled trial. European journal of oncology nursing, 70, 102615.

Chae, D., Kim, J., Kim, S., Lee, J., & Park, S. (2020). Effectiveness of cultural competence educational interventions on health professionals and patient outcomes: A systematic review. Japan Journal of Nursing Science, 17(3), e12326.

Cipta, D. A., Andoko, D., Theja, A., Utama, A. V. E., Hendrik, H., William, D. G., ... & Lumbuun, N. (2024). Culturally sensitive patient-centered healthcare focuses on health behavior modification in low and middle-income nations—insights from Indonesia. Frontiers in Medicine, 11, 1353037.

Dang, T. H. (2025). A patient-centred comprehensive digital intervention solution to improve adherence to oral anti-cancer agents among adults with cancer (Doctoral dissertation, Swinburne).

Fabi, A., Bhargava, R., Fatigoni, S., Guglielmo, M., Horneber, M., Roila, F., ... & ESMO Guidelines Committee. (2020). Cancer-related fatigue: ESMO Clinical Practice Guidelines for diagnosis and treatment. Annals of oncology, 31(6), 713-723.

Gallagher, E. E. (2021). Oral Chemotherapy Patient Education Using the Multinational Association of Supportive Care in Cancer Oral Agent Teaching Tool (Doctoral dissertation, Grand Canyon University).

Glick Alonso, C. L. (2022). Nurse-Led Education on Oral Chemotherapy Medications.

Komatsu, H., Yagasaki, K., Yamaguchi, T., Mori, A., Kawano, H., Minamoto, N., ... & Tamura, K. (2020). Effects of a nurse-led medication self-management programme in women with oral treatments for metastatic breast cancer: A mixed-method randomised controlled trial—European Journal of Oncology Nursing, 47, 101780.

Lee, W. J., Peng, L. N., Lin, C. H., Chen, R. C., Lin, S. Z., Loh, C. H., ... & Hwang, A. C. (2021). Effects of incorporating multidomain interventions into integrated primary care on quality of life: a randomised controlled trial. The Lancet Healthy Longevity, 2(11), e712-e723.

Linardon, J., & Fuller-Tyszkiewicz, M. (2020). Attrition and adherence in smartphone-delivered interventions for mental health problems: A systematic and meta-analytic review. Journal of consulting and clinical psychology, 88(1), 1.

Lu, M., Xia, H., Ma, J., Lin, Y., Zhang, X., Shen, Y., & Hravnak, M. (2020). Relationship between adherence to secondary prevention and health literacy, self-efficacy and disease knowledge among patients with coronary artery disease in China. European journal of cardiovascular nursing, 19(3), 230-237.

Martin, M. (2024). The development of an educational resource on mouth care and oral mucositis for patients receiving chemotherapy in Newfoundland and Labrador.

Oka, L. (2021). The Nurse Will See You Now: Improving Nurse-Led Chemotherapy Teaching.

Palmer, M. J., Machiyama, K., Woodd, S., Gubijev, A., Barnard, S., Russell, S., ... & Free, C. (2021). Mobile phone-based interventions for improving adherence to medication prescribed for the primary prevention of cardiovascular disease in adults. Cochrane Database of Systematic Reviews, (3).

Pezzolato, M., Marzorati, C., Lanzoni, L., Monzani, D., Masiero, M. A., Pietrobon, R., & Pravettoni, G. (2023). Interventions to increase adherence to oral therapies in breast cancer patients: a systematic review based on the behavior change technique taxonomy. Psycho-Oncology, 32(10), 1481-1502.

Rosenberg, S. M., Petrie, K. J., Stanton, A. L., Ngo, L., Finnerty, E., & Partridge, A. H. (2020). Interventions to enhance adherence to oral antineoplastic agents: a scoping review. JNCI: Journal of the National Cancer Institute, 112(5), 443-465.

Sajid, N., Aziz, A., Asif, S., Ashraf, S., Iqbal, A. A., Ali, G., ... & Ikram, J. (2024). Evaluation of Cost-Effective Therapy by Comparing Brands of the Same Formulation in Pakistan. Currents in Pharmaceutical Research, 2(1), 90-111.

Sánchez-Gutiérrez, C., Gil-García, E., Rivera-Sequeiros, A., & López-Millán, J. M. (2022). Effectiveness of telemedicine psychoeducational interventions for adults with non-oncological chronic disease: A systematic review. Journal of Advanced Nursing, 78(5), 1267-1280.

Talens, A., Guilabert, M., Lumbreras, B., Aznar, M. T., & López-Pintor, E. (2021). Medication experience and adherence to oral chemotherapy: A qualitative study of patients' and health professionals' perspectives. International journal of environmental research and public health, 18(8), 4266.

Tipton, J. (2022). Oral medication adherence, attitude, and quality of life in older adults with cancer: The impact of motivational interviewing.

Tolotti, A., Pedrazzani, C., Bonetti, L., Bianchi, M., & Valcarenghi, D. (2021). Patients' and nurses' perceptions of the effectiveness of an oral cancer agent education process: a mixed-methods study. Cancer nursing, 44(3), E151-E162.

Vella, E., White, V. M., & Livingston, P. (2022). Does cultural competence training for health professionals impact culturally and linguistically diverse patient outcomes? A systematic review of the literature. Nurse education today, 118, 105500.

Vyas, K., Rathod, M., & Patel, M. M. (2023). Insight on nano drug delivery systems with targeted therapy in treatment of oral cancer. Nanomedicine: Nanotechnology, Biology and Medicine, 49, 102662.