EPH235

AUBURN UNIVERSITY
Harrison College of Pharmacy

IMPACT OF PHARMACIST-LED INTERVENTIONS IN IMPROVING MEDICATION-RELATED OUTCOMES AMONG CANCER PATIENTS: A SYSTEMATIC REVIEW

Khatiwada AP, M.Pharm[1], Ahmed.M.Kamel, B.Pharm[1] , Qian J, Ph.D,[1]

[1]Department of Health Outcomes Research and Policy, Harrison College of Pharmacy, Auburn University

BACKGROUND

Toxicity associated with anticancer therapy makes pharmacists' intervention crucial in the drug therapy management of cancer patients. Existing studies are available in exploring pharmacists' roles in improving medication-related outcomes for cancer patients.

OBJECTIVE

To study the types and impact of pharmacist interventions aimed at improving medication-related outcomes in cancer patients

METHODS

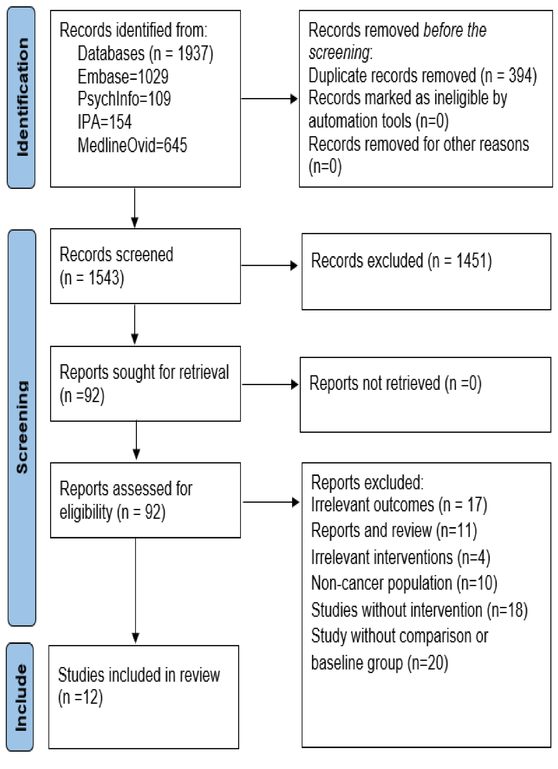
Inclusion criteria

Original articles published until November 3, 2022, with pre-post or control group comparisons of pharmacists' interventions in cancer patients to improve any medication-related outcomes in any settings

Exclusion criteria

Articles that were not published in English, qualitative studies, essays, reviews, reports, commentaries, study protocols, conceptual papers, and conference abstracts

PRISMA flow diagram:



RESULT

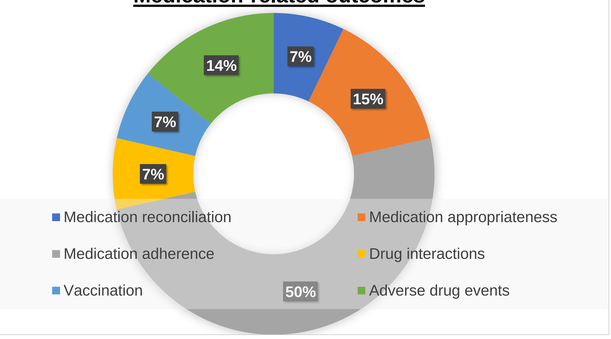
Characteristics of included studies

Authors, Years, Country	Study design, and population	Follow- up (in months)	Quality assessment*	Findings
Aguiar iD et al; 2022; Brazil[1]	Pre-post; Prostrate cancer; n=20	12	Poor	**Medication adherence:** -56.3% of patients' high adherence at baseline; no significant changes in adherence status -No change in average score from the Morisky-Green test (3.0 ±1.3 vs 3.0 ±1.2; p = 1.000)
Al-Taie et al; 2020; Turkey[2]	Randomized controlled; Breast & Colon Cancer; n=100	3	Fair	**Medication adherence:** -Normal care: Medication adherence 52% vs 46% in baseline (p = .06) -Intervention group: 86% vs 52% in baseline (p = 0.0049)
Curry A et al; 2020; USA[3]	Pre-post; NA; n=106	13	Poor	**Medication adherence: -**Baseline adherence: 37% (20 of 54 patients); Adherence at end of intervention period: 85% (44 of 52 patients) (p<0.0001) -Pre-intervention: 4 out of 29 (13.8%) AE resulted in hospitalizations; Post-intervention: 7 out of 39 AEs (18%) resulted in hospitalizations.
Joy et al; 2021; India[4]	Prospective interventional; NA; n=130	6	Poor	**Medication adherence:** -Intervention group: adherence at baseline:6.46±1.36 vs after intervention: 7.71±0.503 (p < 0.001) -Usual care group: 6.65±1.69 vs 6.67±0.901 (p=0.661)
Lam et al; 2015; USA[5]	Retrospective cohort; CML; n=56	31.9	Good	**Medication adherence:** -Intervention group: Imatinib adherence rate 88.6% vs 65.8% in the usual care group (p<0.0046) -Intervention group: mean MPR for all Imatinib patients (n=44) = 94% (baseline for adherence: 90%)
Morgan et al; 2017; USA[6]	Prospective cohort; NA; n=66 (Cohort)	NA	Good	**Medication adherence:** -MPR ratio of specialty pharmacy patients: 0.92 ±0.1 (excellent rate) - Intervention group with 89% of the patients' dose reduction due to side effects by instruction of their physician vs 45% in historical control (p=0.04) -Information on oral chemotherapy by pharmacists after introduction of integrated model 76% vs 36% in historical cohort (p=0.0002)
Moulin et al; 2016; Brazil[7]	Pre-post; CML; n=23	once a month for 4 months	Good	**Medication adherence:** -Number of adherent patients, n= 15 vs 23 before and after intervention; Non-adherent patients, n=8 before vs 0 after intervention; -Average of symptoms/complaints: 3 vs 1 patient before and after intervention
Darcis et al; 2021; Belgium[8]	Case-control; Breast cancer, Multiple myeloma; n=54	1	Poor	**Medication appropriateness:** -Mean aMAI score decreases from 7.3±6.1 to 5.4±4.7, p < 0001 after medication review
Nipp et al; 2019; USA[9]	Randomized controlled; Breast, GI, or lung cancer; n=60	0, week 4: medications 0, week 4 and 8: vaccination	Fair	**Medication appropriateness and vaccination:** -Week 4, intervention group: fewer discrepant (5.82 vs. 8.07, p = .094) and PIMs (3.46 vs. 4.80, p = .069) compared with usual care -Intervention vs control group: pneumonia (20.7% vs. 0.0%, p = .005) and influenza vaccination rate (27.6% vs. 0.0%, p < .001) at week 4, and pneumonia (37.9% vs. 0.0%, p < .001) and influenza vaccination rate (31.0% vs. 0.0%, p < .001) at week 8
Vega et al;2016;Spain[10]	Randomized controlled; Colorectal, lung, breast cancer; n=147	1st through rest of chemotherapy cycles	Fair	**Medication reconciliation:** -Intervention group: 3 patients with RERP vs 21 in control group (relative risk = 0.13, p = 0.0009) -Incidence of RERP incidence reduced by 26%, (p < 0.0001) after intervention
Choukroun et al; 2020; France[11]	Prospective observational; Breast & Colorectal cancer; n=51	NA	Poor	**PIM use & ADE risk:**- -Prevalence of PIM use reduction (Laroche: 31.4% to 5.9%, p=0.002), START criteria (66.7% to 5.9%; p < 0.001) & ADE score (4.0 vs 2.0 before & after medication review, p=0.023)
Kovacevic et al; 2020; Republic of Srpska[12]	Prospective cohort; NA; n=88	16	Poor	**Drug interactions:** -Intervention group:10 clinically significant interactions versus 24 in control group (p=0.002) -Progression-free survival: significantly longer in intervention group (p=0.001)

DDI: Drug-drug interaction; PIM: Potentially inappropriate medication; ADE: Adverse drug event; CML: Chronic myeloid leukemia; GI: Gastrointestinal; aMAI: adapted Medication Appropriateness Index; MPR: Medication Possession ratio; RERP: reconciliation error that reached the patient; AE: Adverse events

**Quality assessment of the included papers was done using the NIH tool[13] and a score for each item was added. The articles were classified based on the total scores using the criteria 13-14= good;9-12= fair; scores below 9 were deemed to be of poor quality[14]*

Medication-related outcomes



Components of interventions	Frequency
Patient education and counseling	11
Medication review	6
Medication reconciliation	1
Communication to physician	5
Toxicity/Side effects monitoring and management	2
Regimen calendar	1
Drug intercations anlaysis	1
Pill Organizer	2
Reminder about medications and refills by phone	2
Vaccination review	1
Determination of discrepancies requiring clarification (DRCs)	1

SUMMARY OF FINDINGS

- Half of the studies (n=6)[2,4,7,9,10,11] were conducted in oncology units of hospitals, and others in outpatient oncology clinics (n=2)[5,6], hospital pharmacy (n=1)[8], university pharmacy (n=1)[1], and cancer center (n=1)[3] and lung disease clinic (n=1)[12].
- Pharmacist-led interventions showed a significant improvement in medication adherence rates in the intervention group in most studies (6 out of 7)[2-7].
- A significant decrease in aMAI score (7.3±6.1 to 5.4±4.7, p < 0001)[8] and ADE score (4 to 2, p=0.023)[11] were observed after medication review by pharmacists

CONCLUSIONS

- The involvement of pharmacists as a part of a multidisciplinary team in patient care and drug therapy management in cancer patients has improved various medication-related outcomes.
- Medication adherence is a widely assessed outcome among cancer patients as compared to other medication-related outcomes. A few randomized control studies are conducted for medication adherence, medication reconciliation, and medication appropriateness showing improvement in these parameters with pharmacists' interventions.