# Impact of Clinical Pharmacist Intervention/Patient Counselling in Cancer Patients Health Related Quality of Life: A Systematic Review

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**ABSTRACT:** The research review is conducted to assess the clinical pharmacist interventions/patient counseling impact on cancer patients quality of life (QoL). Most of the anticancer drugs have low therapeutic index and significant levels of toxicity which may lead to drug related issues, in such situations the effectiveness of the treatment may be significantly impacted by a clinical pharmacist intervention. A clinical pharmacist intervention includes patient counseling, medication adherence, drug interactions and management of adverse events. The pharmacist intervention has a positive role in increasing chemotherapy related knowledge, improving patient positive emotions dealing with adverse reactions caused by chemotherapy and improving the patients QoL. Hence, the impact of clinical pharmacist interventions especially, patient counselling role and outcome in cancer patients QoL were assessed.

**Key Words:** Clinical Pharmacist Intervention, Patient counselling, Anticancer drugs adverse events and Quality of life (QoL).

**Introduction:** Cancer is characterized when a normal functioning cell undergoes genetic mutation which leads to abnormal proliferation of the cell and is known as neoplasm (tumor) and is the considered to be leading cause of death in recent years. Constant rise in the cancer lead to invention of diagnosis and treatment. In which chemotherapy is one of the treatment practices for cancer. Regardless of how, most anticancer drugs have Adverse Drug Reactions (ADRs) and varying toxicity levels depending upon the physiology of Individuals. Due to lack of knowledge about ADRs of anticancer drugs most of them have misconception about cancer treatment or chemotherapy.

Cancer is a leading cause of premature death and disability worldwide. Almost 14.9 million new cases of cancer were estimated worldwide and 8.2 million deaths in 2013.[1] The increase in morbidity and mortality as a result of cancer is fuelled by population growth, ageing and less mortality from infectious diseases, as well as the adoption of Western diet and lifestyle, particularly in low- and middle-income countries.[2] Added to clinical burden, this disease imposes a substantial economic burden on society, with the cost estimated to be up to 4% of global gross domestic product.[3] Thus, strategies to address the screening, diagnosis, treatment and palliation needs of cancer patients are required and should be considered as a sound investment by governments.[4] Chemotherapy is an important treatment for cancer patients, also need consultation during their treatment to improve QoL and decrease psychological disorders. Drugs play an important role in cancer treatment; however, most anticancer drugs have high toxicity and low therapeutic indexes, resulting in drug-related issues that often need dose adjustments and analysis of potential drug interactions.[5] Moreover, medication adherence in patients with cancer might be low and influenced by several factors, such as the patients values, lifestyle and beliefs, access to health services and factors related to drug therapy (Eg; greater number of medications prescribed and undesirable adverse effects).[6] The knowledge and skills of an oncology pharmacist could support a wide variety of functions in all aspects of patient care. This professional is often one of the few healthcare team members who fully understands the safety, efficacy and pharmacologic and financial components of care of patients with cancer.[7] In this context, pharmacists have become more proactive as they have been integrated into care teams, participating directly in the selection and management of patient drug therapy, as well as proving drug counselling for patients and other health professionals.[7, 8]

Evidences suggests that clinical pharmacists help to improve medication-related problem prevention and management in cancer care. Patients can better understand their medications with the assistance of clinical pharmacist Pharmaceutical Intervention (PI). A Prospective, randomized controlled study displayed that there is improvement of patients medication-related ADRs (nausea, vomiting, pain), cognitive and emotional function.[9] A Prospective comparative study describes there is a significant change in patients QoL when compared between the 1st, 2nd and 3rd cycle chemotherapy among counselled and non-counselled patients.[10] According to world-wide studies which include Malaysia[11], Egypt[12] shows the upgrade of patient health related QoL by clinical pharmacist providing patient counselling about the anticancer drugs benefits and side-effects, which improves their physical health, Psychological, Social relationships.[12] Studies suggests the decrease of side-effects like anemia,

neutropenia, nausea or vomiting and other related ADRs of anticancer drugs are much better in counselled than non-counselled patients.[11]

Pharmaceutical care was defined as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve the patient QoL. Assessing the role of clinical pharmacist practicing pharmaceutical care requires the quantification of parameters that are important to the patient and the health care system.[13] The PI include patient counseling, medication adherence, drug interaction and management of adverse events.[14] The outcome of patient counseling was measured by the interaction between time spent with the patient by the pharmacist, understanding of medication and desire for future pharmacy counseling services.[13] The role of pharmacist was limited in the past. However, from the past few decades, pharmacists have begun to extend their role by providing direct patient care, investigating drug services and uplifting patient health-related QoL.[15]

Recent studies on cancer patients, pharmacist services have demonstrated improvements in clinical and economic outcomes for cancer patients. Because of their training and experience in the management of cancer diseases, oncology specialist pharmacy practioner now play a wider role than just ensuring the safety and effectiveness of customized chemotherapy regimens. They can also take on management responsibilities, provide investigational drug services or improve patients QoL in relation to their health. The patients have been provided with various pharmacist services in oncology, such as the provision of anticancer drugs and supportive care in drug-related issues oncologist, medication chart review to verify the appropriateness of anticancer drugs dose, dosage form, dosing frequency and supportive care.[14]

The involvement of clinical pharmacist in the palliative oncology team, especially for ambulatory care, minimizes the risk of drug related issues by regulating polypharmacy and promoting drug adherence. The crucial role of clinical pharmacist as masters of personalized procedures for palliative in- and outpatients directly relates to the efficacy of the provided care and their improvement in QoL.[16] Numerous studies showed that the QoL in cancer patients is an important predictor of survival and the psychological problems of cancer patients should be considered by physicians before treatment of cancer patients.[11]

A previous systematic review[17] explored the role of pharmacists in communicating to people living with cancer about their use of complementary medicines, whereas another review[18] assessed models of PIs in assisting oncology patients. However, to the best of our knowledge, summarized evidence on the effect of PIs in patients with cancer is lacking in the current literature. In order to address this gap, the purpose of this systematic review was conducted to describe and examine the effect of PIs on health outcome measures of adult cancer patients using anticancer drugs.

**Study Method:** A comprehensive literature review search was performed through google in various reputed journals for 3 - months to identify relevant articles for the study of 'Impact of Clinical PI/Patient Counselling in Cancer Patients Health Related QoL'. We collected an electronic database search from different articles published in different journals. The search strategy included the use of terms or text words related to PI, patient counseling, quality of life, cancer chemotherapy etc., The method of analysis and inclusion criteria for this review were specified in advance and documented.

To be included in this review, the articles had to meet the following criteria: (i) be an original article (i.e., randomized controlled trials, non-randomized controlled studies, cohort studies, cross-over studies, before-and-after studies); (ii) be published in any national or international journals in English; (iii) have evaluated the effect of PIs in the clinical pharmacy services (i.e., activities in which the pharmacist makes a clinical decision-making process aimed at improving the patients health outcomes); (iv) report possible changes over time in outcome measures (i.e., changes from pre- to post-PIs) and (v) include adult cancer patients using anticancer drugs.

Studies without a clear description of interventions; with multiprofessional interventions not led by the pharmacist; patients with other diseases than cancer in which the relevance to the population of interest could not be appraised were excluded. The full-text articles were reviewed to determine whether they met the prespecified inclusion criteria. Any disagreements were resolved by consensus through discussion.

**The studied articles were summarized as;**

**Study 1:** Yan Wang et al., (2015)[9] conducted a prospective, randomized, controlled trial to evaluate the efficacy of pharmaceutical intervention (PI) on chemotherapy Knowledge Attitude Practice (KAP) and quality of life (QoL) in cancer patients, to ascertain the effect of clinical pharmacy services on QoL and Chemotherapy KAP on 149 cancer patients (77 in the Pharmacist Intervention (PI) group and 72 in the control group). When comparing the pre and post study scale ratings, the study indicates that there was a substantial improvement in the PI group cognitive and emotional function (P<0.05) and a significant decrease in side effects such diarrhoea, nausea, vomiting, pain, and insomnia (p<0.05). Nonetheless, PI has a positive role in increasing chemotherapy-related knowledge, improving patients positive emotions, dealing with chemotherapy adverse reactions, and improving the QoL of patients.

**Study 2:** Kazuhide Tanaka et al., (2018)[10] to determine the influence of PI, conducted a prospective comparative survey study to assess the QoL of 39 breast cancer patients who underwent their initial course of cancer chemotherapy and the impact of pharmacist counselling on reducing the incidence of adverse events. A QoL survey was conducted before the 1st, 2nd and 3rd courses of treatment, 20 in intervention group with pharmacist counseling and 19 in non-intervention group with no pharmacist counseling. Both groups were compared immediately before, the 1st and 2nd course, a significant difference was observed for malaise (p = 0.043), with the non-intervention group experiencing them to a greater degree than the intervention group, similarly the 1st and the 3rd course, a significant difference was observed for nausea (p = 0.017), with the non-intervention group experiencing it to a greater degree than the intervention group. The non-intervention group experienced these effects more than the intervention group, indicating that pharmacist counselling improved the PI groups QoL and treatment outcomes.

**Study 3:** Ummavathy Periasamy et al., (2017)[11] carried out a single-blind randomized controlled trial to develop, implement and evaluate the effectiveness of a chemotherapy counseling module by pharmacists among oncology patients on their QoL and psychological outcomes in Malaysia, among 162, the study revealed that the module along with repetitive counseling showed significant improvement of QoL in

the intervention than the control group with a large effect size in physical health (p = 0.001), psychological (p = 0.001), social relationships (p = 0.001) and environment (p = 0.001) and decrease in the anxiety (p = 0.000), depression (p = 0.000) among oncology patients undergoing chemotherapy.

**Study 4:** Dina K. Farrag *et al.,* (2020)[12] conducted a single-center interventional prospective study to determine if PI could improve clinical outcomes, among 60 Egyptian breast cancer patients. The study results shown a significant reduction in toxicity and side effects, like grade 2 anemia from 17 - 1.7%, a grade 4 neutropenia from 10 - 0%, and grade 4 nausea/vomiting from 5 - 0% PI. Regarding patients QoL, improvement of mean ± standard deviation of most of the QoL scales such as systematic therapy, side-effects decreased with P < 0.001. Most treatments for breast cancer despite beneficial result in toxicities, primarily anemia, neutropenia, nausea and pain, adversely impact patient QoL and can lead to treatment discontinuation. Clinical PI resulted in beneficial clinical outcomes in patients with breast cancer such as the reduction of treatment-related side-effects and the improvement of patients QoL.

**Study 5:** Megan McKee *et al.,* (2009)[13] conducted a cross-sectional survey study to identify the role of the patient-pharmacist relationship and enhance patient satisfaction with care, a 20-item, 2-page survey tool was developed and utilized, among 112 patients surveyed on cancers of the breast 26.3%, lung 23.3%, colon/gastrointestinal 14.4%, lymphoma 5.2%, prostate 3.9%, leukaemia 2.6%, testicular 1.7%, others 22% (age group 18 - 78). Of the patients surveyed, 86% stated that it is important for patients to discuss their treatment with a pharmacist and 76% requested pharmacy follow-up at future visits. Reveals that patients are interested in visiting with a pharmacist regularly during chemotherapy treatment and patients may be willing to pay for pharmacy counseling services.

**Study 6:** Avinash Khadela *et al.,* (2021)[14] conducted a prospective, single-center study to investigate the change in quality adjusted life-years (QALYs) after providing oncology pharmacist services to assess its impact on humanistic outcome. A total of 230 breast cancer patients were screened and 105 were recruited into a control group (CG) and an intervention group (IG), with 54 and 51 respectively. The oncology pharmacist services (OPS) were provided only for the IG and humanistic outcome was measured by incorporating the EQ-5D-5L instrument to calculate quality-adjusted life-years (QALYs) in both the groups. The majority of patients in the CG were facing improper administration of pre-medication (83.3%), lack of knowledge regarding chemo-mixing, counselling in nursing staff (66.7%) and a sub-therapeutic dose of antiemetics (37%). The baseline QALY at the inception of chemotherapy was 0.040 and 0.014 in CG and IG, respectively. After the completion of the 6 - chemotherapy cycle, the QALY was found to be 0.042 and 0.043 in CG and IG, respectively. The study has demonstrated that the improvisation in QALY after provision of oncology pharmacist services reflect the positive impact of oncology pharmacist on humanistic outcomes. The study also provided the opportunity to identify the thrust area where more clinical pharmacy exposure is needed in order to improve patient care.

**Study 7:** L. R. P. Colombo *et al.,* (2017)[15] conducted a study to examine the effects of PIs on adult outpatients with cancer using antineoplastic drugs. A literature search was performed using PubMed, ISI Web of Science and LILACS databases, using MeSH terms or text words related to pharmacist interventions, cancer and outpatient care. A total of 874 records were identified, of which 11 satisfied

the inclusion criteria and included patients aged >50 years. PIs primarily included educating and counselling patients on the management of adverse events. Rates of nausea and vomiting control, medication adherence and patient satisfaction were the most common outcome measures; a significant benefit in these parameters as a result of PIs was noted in most studies. The findings from this systematic review indicate that pharmacist interventions can improve outcome measures in outpatients with cancer. However, the collective quality of the studies was poor and gaps identified indicate that further research is needed to provide more robust results.

**Study 8:** Martina Novosadova *et al.,* (2023)[16] conducted a prospective open label non-randomised clinical study to evaluated the importance of a clinical pharmacist in the palliative care team. A total of 250 outpatients, 126 women (50.4%) and 124 men (49.6%), with a mean age of 71 years. The patients had the performance status scale 0–3. Clinical examinations were performed on a monthly basis (n=509 check-up visits). The clinical pharmacist prepared an educational chart for all medications used after each visit and evaluated any drug-related problems. Follow-up was 6 months, found a significant association between drug related-problems and polypharmacy (p < 0.001). A low risk of drug-related problems was observed during the initial visit, that is, 68 female (27.2%) and 25 male (10.4%) patients. A greater clinical pharmaceutical risk was observed among the patients taking antihypertensive drugs (p=0.003) and/or β - blockers (p=0.048). Study confirms the essential role of a clinical pharmacist in oncology palliative care. The feedback obtained from the patients showed a notable improvement in their QoL.

**Study 9:** In 2010 Lea Knez, Raisa Laaksonen and Catherine Duggan, (2010)[19] conducted a study at a tertiary cancer centre in London, 2 - research pharmacists during the clinical screening of chemotherapy prescriptions and release of prepared drugs. 21 - Pharmacist interventions were recorded during the screening of 130 prescriptions, i.e., Drug and therapy (38%), clerical (22%), dose, frequency and duration (19%) related problems most often required an intervention, identifying areas in chemotherapy prescribing that need improvement. The proposed recommendations were implemented in 86% of the cases. Many recorded interventions (48%) were ranked to have had a very significant influence on patient care. Hence, clinical interventions made by pharmacist had a significant impact on patient care. The integration of pharmacist technical and clinical roles into dispensing of chemotherapy doses is required for providing high-quality cancer services.

**Study 10:** Saravana Kumar Ramasubbu *et al.,* (2021) conducted a cross-sectional study, to assess the QoL and factors affecting it in adult cancer patients undergoing chemotherapy treatment. A total of 120 adult (>19 years) patients were recruited and data were collected using patient record form and Functional Assessment of Cancer Therapy-General (FACT-G), a QoL questionnaire. The overall mean score of QoL was 61.933 ± 5.85502. The domains of functional well-being and emotional well-being were most negatively affected after cancer chemotherapy. Education (illiteracy) and occupation (unemployment) were negatively associated with overall QoL of cancer patients on chemotherapy. Adverse drug reactions due to cancer chemotherapy negatively affect the QoL of cancer patients. Education (illiteracy) affects social well-being domain of cancer patients. Working in the

government/private sector has a positive impact on functional well-being domain of QoL. The study findings suggest an overall low QoL among adult cancer patients undergoing chemotherapy. A stressful therapy, also affecting both psychological and physical well-being. Poor infrastructure, illiteracy, poverty and lack of proper treatment facilities at most centres often lead to poor survival outcomes and hence focus has always been on achieving quantity of life rather than QoL. This is further complicated due to nonavailability of validated tools in local vernacular, apathy of the treating physicians in the context of QoL aspects and social and cultural factors that are unique to this society. Psycho-oncology needs to become an integral entity of comprehensive cancer care.

Cancer drugs are high risk drugs and medication errors in their prescribing, preparation and administration have serious consequences, including death. The importance of a multidisciplinary approach and the benefits of clinical pharmacist contribution in cancer treatment to minimise risk have been established. However, the impact of services provided by pharmacists to cancer patient care is poorly studied. This study explored the PIs in cancer chemotherapy and evaluated pharmacist contribution to patient care.

**Conclusion:** The discovery of new medicines has led to an increase in the complexity of cancer care and its associated side effects. The clinical pharmacist trained in an oncology setting is well suited to be the expert for drug-related issues. Implementing the oncology pharmacist services helps to identify the major issues and their potential causes in oncology patients. Patient counseling services in an oncology clinic are vital to a patient understanding chemotherapy and supportive medications, as well as to improve their QoL. Patient satisfaction with pharmacy services is high, but improvement is necessary. The impact of clinical pharmacists is high in improving the QoL of cancer patients by providing proper patient counseling.

**Conflict of Interest:** The content of the article is free of conflicts of interest, according to the authors.

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