

Impact of Clinical Pharmacist Interventions on Medication Adherence, Lifestyle Modification, and Cardiometabolic Outcomes in Non-alcoholic Fatty Liver Disease

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Abstract

Background: Non-alcoholic fatty liver disease (NAFLD) is closely associated with cardiometabolic disorders and is frequently complicated by suboptimal medication adherence, drug-related problems (DRPs), and inadequate lifestyle modification. Evidence describing the clinical impact of pharmacist-led interventions in NAFLD management remains limited. **Objectives:** The objective of the study was to evaluate the effect of structured clinical pharmacist interventions on medication adherence, lifestyle behaviors, DRPs, and cardiometabolic outcomes in adults with NAFLD. **Methods:** A prospective observational interventional study was conducted over a 12-month follow-up period at a government general hospital, Anantapur. Adult patients with NAFLD ($n = 379$) received clinical pharmacist-led interventions, including medication reconciliation using the best possible medication history approach, DRP identification based on the Pharmaceutical Care Network Europe classification, physician-directed recommendations, and individualized counseling on medication use and lifestyle modification. Clinical, biochemical, and patient-reported outcomes were evaluated at baseline and follow-up visits. **Results:** Pharmacist-led interventions were associated with significant improvements in adherence, knowledge, and lifestyle behaviors. A total of 48 clinically relevant DRPs were identified, with most pharmacist recommendations accepted by physicians. Significant improvements were observed in cardiometabolic parameters, including hemoglobin A1C (6.82 ± 1.12 vs. 6.34 ± 0.96 , $P < 0.001$), low-density lipoprotein-cholesterol ($P < 0.001$), body mass index ($P < 0.001$), blood pressure, and Fatty Liver Index scores. Correlation analyses demonstrated significant associations between adherence, satisfaction, and clinical outcomes. **Conclusion:** Structured clinical pharmacist interventions improve medication safety, adherence, behavioral outcomes, and cardiometabolic risk indicators in NAFLD patients, supporting their integration into multidisciplinary care models.

Key words: Cardiometabolic outcomes, clinical pharmacist intervention, drug-related problems, medication adherence, non-alcoholic fatty liver disease, non-alcoholic steatohepatitis