



CODEN [USA]: IAJPBB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.20411812>Available online at: <http://www.iajps.com>

Review Article

**A REVIEW ON ASSESSMENT OF MEDICATION
ADHERENCE IN HOSPITALISED PNEUMONIA PATIENTS****Alfiya Sudheer F^{*1}, Dr.Nithin Manohar R², Ms.Shinju Somaraj³, Sandra S S¹,
Chandini Nair¹, Reeba Roy¹, Dr.Prasobh G R⁴**¹Student, Second Year Doctor of Pharmacy Post Baccalaureate, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.²Professor & HOD, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.³Lecturer, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.⁴Principal, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.**Abstract:**

Pneumonia continues to be a major public health concern worldwide, particularly in developing countries, contributing significantly to morbidity, mortality, and healthcare burden. Among hospitalized patients, effective management of pneumonia largely depends on appropriate and timely pharmacotherapy, especially antibiotic administration. Medication adherence, defined as the extent to which a patient's medication-taking behavior corresponds with prescribed recommendations, plays a critical role in determining therapeutic outcomes. Poor adherence to prescribed regimens, including incorrect dosing, missed doses, or premature discontinuation of therapy, can result in treatment failure, prolonged hospital stay, increased healthcare costs, and the emergence of antimicrobial resistance. Recent evidence suggests that adherence to guideline-concordant therapy significantly improves clinical outcomes and reduces mortality rates. However, adherence levels among hospitalized pneumonia patients remain suboptimal, with reported rates ranging between 30% and 65%. Assessment of medication adherence using validated tools such as the Adherence to Refills and Medications Scale (ARMS) is essential for identifying non-adherence and implementing targeted interventions. This review aims to provide a comprehensive overview of medication adherence in hospitalized pneumonia patients, including its importance, prevalence, influencing factors, assessment methods, clinical consequences, and strategies to improve adherence through patient education, clinical pharmacist involvement, and antimicrobial stewardship programs.

*Keywords: Pneumonia, Medication Adherence, ARMS Scale***Corresponding author:****Alfiya Sudheer F,**

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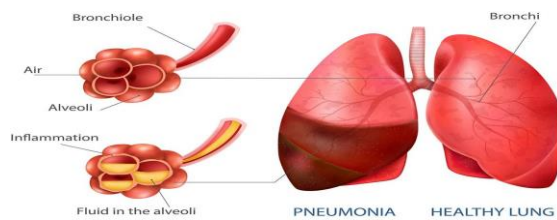
Please cite this article in press Alfiya Sudheer F et al., A Review On Assessment Of Medication Adherence In Hospitalised Pneumonia Patients., Indo Am. J. P. Sci, 2026; 13(05).

INTRODUCTION:

Pneumonia is an acute infection of the lung parenchyma characterized by inflammation of the alveoli, which may become filled with fluid or pus, leading to impaired gas exchange. It is caused by a variety of microorganisms, including bacteria, viruses, and fungi, with bacterial pneumonia being the most common in hospitalized patients.

Based on the setting of acquisition, pneumonia is classified into community-acquired pneumonia (CAP), hospital-acquired pneumonia (HAP), and ventilator-associated pneumonia (VAP). The disease presents with symptoms such as fever, cough, dyspnea, chest pain, and fatigue, and its severity can range from mild illness to life-threatening conditions requiring intensive care.

Pneumonia remains a major cause of morbidity and mortality worldwide, particularly among elderly individuals, children, and patients with comorbid conditions. Effective management relies on timely diagnosis and appropriate antimicrobial therapy, where medication adherence plays a crucial role in ensuring successful treatment outcomes.



PNEUMONIA: AFFECTED AND HEALTHY LUNG

IMPORTANCE OF MEDICATION

Medication adherence plays a pivotal role in achieving favorable clinical outcomes in pneumonia patients. Proper adherence ensures effective antimicrobial action, leading to the complete elimination of infectious organisms. In contrast, non-adherence may result in subtherapeutic drug levels, allowing pathogens to persist and potentially develop resistance.

From a clinical perspective, adherence reduces the risk of complications such as sepsis, respiratory failure, and progression to severe pneumonia. It also minimizes the likelihood of relapse and readmission. In terms of healthcare outcomes, adherence contributes to shorter hospital stays, reduced need for intensive care, and lower mortality rates.

Furthermore, adherence has significant public health implications. Inappropriate use of antibiotics due to poor adherence is a major

contributor to antimicrobial resistance, which poses a global threat. Ensuring adherence to prescribed regimens is therefore essential not only for individual patient outcomes but also for the broader goal of preserving antibiotic efficacy.

PREVALENCE OF MEDICATION NON-ADHERENCE

Medication non-adherence is a common issue among hospitalized pneumonia patients. Recent studies have reported adherence rates ranging from 30% to 65%, indicating considerable variability across different healthcare settings. Additionally, approximately half of the patients are found to receive non-guideline-concordant therapy, further highlighting the magnitude of the problem.

Non-adherence may manifest in various forms, including missed doses, incorrect dosing intervals, and premature discontinuation of treatment. These patterns are particularly observed among elderly patients, those with multiple comorbidities, and individuals admitted to intensive care units.

The high prevalence of non-adherence underscores the need for systematic assessment and intervention strategies to improve medication-taking behavior and ensure optimal treatment outcomes.

FACTORS AFFECTING MEDICATION ADHERENCE

1. Patient-related factors

- Poor knowledge regarding disease and treatment
- Low health literacy
- Fear of adverse drug reactions
- Psychological factors such as anxiety and confusion

2. Therapy-related factors

- Complex medication regimens
- Polypharmacy
- Long duration of treatment
- Side effects of medications

3. Healthcare system-related factors

- Inadequate patient counselling
- Poor communication with healthcare providers
- Lack of adherence monitoring
- Variability in prescribing practices

4. Disease-related factors

- Severity of pneumonia

- Presence of comorbid conditions
- ICU admission

ARMS SCALE IN ASSESSMENT OF MEDICATION ADHERENCE

The Adherence to Refills and Medications Scale (ARMS) is a validated, self-reported tool used to assess medication adherence, particularly suitable for hospitalized patients.

Structure

- Total 12 items
- Divided into two domains:
 - Medication-taking adherence (8 items)
 - Refill adherence (4 items)
- Areas assessed
 - Forgetting to take medications
 - Skipping or missing doses
 - Stopping medication early
 - Difficulty following schedules
 - Delay in refilling prescriptions
 - Running out of medications

Scoring system

Each item is scored on a 4-point Likert scale:

- 1 → None of the time
- 2 → Some of the time
- 3 → Most of the time
- 4 → All of the time

Interpretation

- Total score range: 12–48
- Lower score → better adherence
- Higher score → poor adherence

Typical classification:

- 12–16 → High adherence
- 17–32 → Moderate adherence
- > 32 → Poor adherence

CLINICAL CONSEQUENCES OF NON-ADHERENCE

Poor medication adherence has significant clinical, economic, and public health consequences. Clinically, non-adherence can lead to treatment failure, disease progression, and increased risk of complications such as sepsis and respiratory distress.

From a hospital perspective, non-adherence is associated with prolonged hospitalization,

increased need for intensive care, and higher readmission rates. Economically, it results in increased healthcare costs due to extended treatment duration and use of more expensive second-line therapies.

At the public health level, non-adherence contributes to the development and spread of antimicrobial resistance, which is a major global concern.

ROLE OF PATIENT EDUCATION

Patient education plays a key role in improving medication adherence.

Components

- Disease awareness
- Importance of adherence
- Proper medication usage
- Awareness of side effects

Impact

- Improved patient knowledge
- Better adherence behavior
- Reduced complications

ROLE OF CLINICAL PHARMACIST

Clinical pharmacists contribute significantly to improving adherence through:

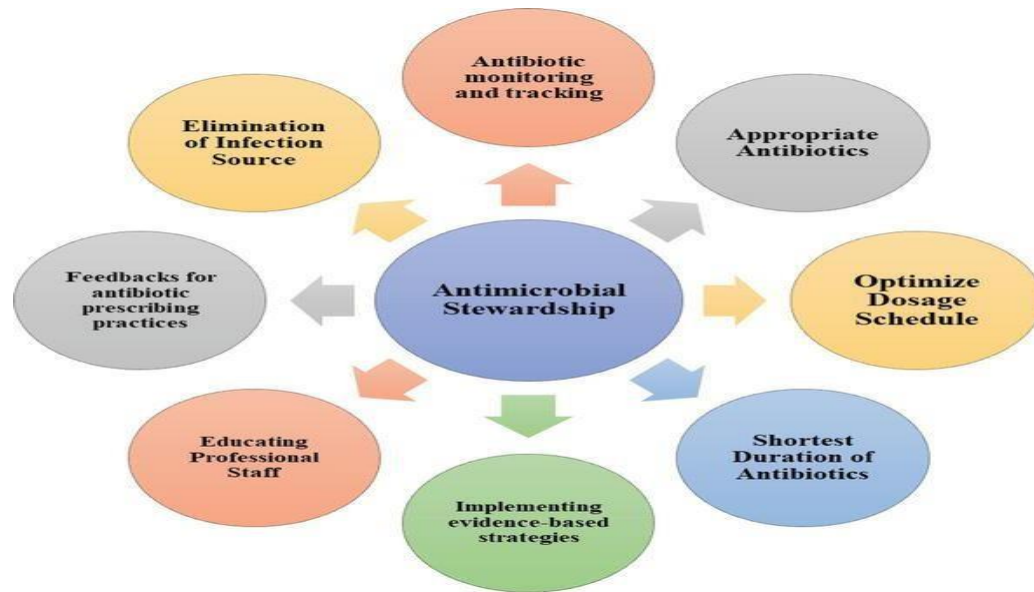
- Patient counselling
- Monitoring medication therapy
- Identifying drug-related problems
- Promoting rational antibiotic use

Their involvement improves adherence and clinical outcomes.

ANTIMICROBIAL STEWARDSHIP AND ADHERENCE

Antimicrobial stewardship programs are designed to optimize antibiotic use and improve adherence to treatment guidelines. These programs involve multidisciplinary approaches, including monitoring prescribing practices, educating healthcare providers and patients, and implementing standardized protocols.

Effective stewardship programs contribute to improved adherence, reduced antimicrobial resistance, and better patient outcomes.



APPROACHES TO ANTIMICROBIAL STEWARDSHIP

INTERVENTIONS TO IMPROVE MEDICATION ADHERENCE

Effective strategies include:

- Patient education
- Pharmacist-led interventions
- Adherence assessment tools such as ARMS⁶
- Clinical decision support systems

These interventions significantly improve adherence and outcomes⁵.

RESEARCH GAP

Despite substantial research on pneumonia management, limited studies have specifically evaluated medication adherence in hospitalized pneumonia patients using validated assessment tools such as the ARMS scale.

Existing literature predominantly focuses on chronic diseases, with insufficient attention to adherence behavior in acute infectious conditions. Furthermore, there is a lack of well-designed interventional studies and limited data from Indian healthcare settings.

Hence, there is a need for comprehensive studies assessing medication adherence and its impact on clinical outcomes in this population.

CONCLUSION:

Medication adherence is a critical determinant of successful treatment outcomes in hospitalized pneumonia patients. Effective management of pneumonia relies not only on appropriate drug selection but also on the patient's adherence to the prescribed regimen in terms of dose, frequency,

and duration. However, evidence indicates that adherence in this population remains sub optimal, contributing to treatment failure, prolonged hospital stay, increased healthcare costs, and the development of antimicrobial resistance.

Assessment of medication adherence using validated tools such as the ARMS scale provides a practical and reliable method to identify non-adherence and understand patient behavior. Early detection of adherence issues enables healthcare professionals to implement timely and targeted interventions.

Factors influencing adherence are multifactorial, including patient-related, therapy-related, and healthcare system-related aspects. Addressing these factors through structured patient education, effective communication, and clinical pharmacist involvement plays a significant role in improving adherence.

Furthermore, integrating adherence assessment into routine clinical practice, along with antimicrobial stewardship strategies, can enhance treatment effectiveness and optimize patient outcomes.

In conclusion, improving and systematically assessing medication adherence should be considered an essential component of pneumonia management in hospitalized patients. A multidisciplinary and patient-centered approach is necessary to ensure better adherence, improved clinical outcomes, and reduced healthcare burden.

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