

Evaluation of Impact of Pharmacists on Improving the Therapeutic Outcomes in Pediatrics

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ABSTRACT

Pharmacists play a critical role in optimizing medication therapy and enhancing therapeutic outcomes for paediatric inpatients, who face unique challenges due to physiological variability, developmental stages, and dependence on caregivers for medication administration. Non-adherence to prescribed regimens, affecting up to 50% of paediatric patients, significantly compromises treatment efficacy, increases risks of complications, and escalates healthcare costs. This study evaluates the impact of pharmacist-led interventions on therapeutic outcomes in paediatric inpatient settings, focusing on adherence improvement, error reduction, and clinical efficacy. Utilizing the 8-item Morisky Medication Adherence Questionnaire (MMAS-8), adherence levels were assessed pre-and post-intervention, alongside monitoring of medication errors and clinical outcomes. Pharmacist interventions included structured patient and caregiver education, individualized counselling, identification of barriers (e.g., administration difficulties, dosing complexity, side-effect concerns), and collaborative development of tailored treatment plans. Results demonstrated a statistically significant improvement in medication adherence scores post-intervention, alongside a reduction in medication errors and enhanced therapeutic outcomes, including shorter hospital stays and fewer readmissions.

The study underscores the value of integrating pharmacists into paediatric care teams to address systemic and patient-specific adherence challenges. Pharmacist involvement not only optimizes medication safety and efficacy but also strengthens caregiver engagement, ensuring continuity of care. These findings advocate for expanded pharmacist-led initiatives in paediatric inpatient settings as a cost-effective strategy to improve health outcomes,

reduce healthcare burdens, and promote the long-term well-being of paediatric populations. By bridging gaps in medication management, pharmacists emerge as indispensable contributors to high-quality, patient-centered paediatric care.

Key Words: Medication Adherence, Paediatrics, MMAS-8

I. INTRODUCTION

Medication Adherence

According to World Health Organization Medication adherence, defined by as "the degree to which a person's behaviour corresponds with the agreed recommendations from a health care provider," is a critical factor in achieving successful treatment outcomes. Despite its importance, approximately one in four patients struggle to adhere to prescribed drug therapies. This issue is particularly prevalent among patients with chronic conditions, with nearly 50% failing to follow their medication regimens as directed. Poor adherence can lead to reduced therapeutic effectiveness, increased risk of complications, higher hospitalization rates, and even greater mortality.

For healthcare professionals, ensuring medication adherence remains a significant challenge. While evidence-based medicine guides clinicians in making informed decisions about drug therapy, the responsibility for adherence ultimately lies with the patient. Understanding the factors that influence adherence and developing effective strategies to address them are essential for improving patient outcomes and reducing healthcare costs. This article explores the complexities of medication adherence, its impact on treatment success, and the importance of addressing this pervasive issue in healthcare.(1)

Paediatrics

Paediatrics is the branch of medicine focused on the health, development, and diseases of children. Each age group has unique physiological, pharmacological, and therapeutic needs, making paediatric care distinct from adult medicine. Children are particularly vulnerable to drug-related problems due to differences in how their bodies process medications. Paediatric care spans preventive health, diagnosis, and treatment of acute and chronic conditions, aiming to support the physical, emotional, and social well-being of children from infancy to young adulthood. With ongoing advancements in medical research and technology, paediatric care continues to evolve, offering innovative solutions to improve child health outcomes.(2,11)

Measuring Adherence

Adherence to medication can be measured using various methods, which can be categorized into direct and indirect measures. Here are some common methods (5,13)

Direct Measures

1. Direct Observation
2. Medication Event Monitoring Systems (MEMS)
3. Smart Pill Bottles

Indirect Measures

1. Self-Report
2. Pill Counts
3. Refill Records
4. Medication Possession Ratio (MPR)
5. Proportion of Days Covered (PDC)
6. Claims Data

Scales

There are several types of scales used to measure medication adherence. Here are some of the most commonly used scales:

1. Morisky Medication Adherence Scale (MMAS)

- An 8-item self-report scale that assesses patients' adherence behavior and attitudes.
- Scores range from 0 to 8, with higher scores indicating better adherence. (7,9)

2. Medication Adherence Report Scale (MARS)

- A 5-item self-report scale that assesses patients' adherence behavior and attitudes.
- Scores range from 0 to 25, with higher scores indicating better adherence.

3. Adherence to Refills and Medications Scale (ARMS)

- A 12-item self-report scale that assesses patients' adherence to medication refills and dosing schedules.
- Scores range from 0 to 100, with higher scores indicating better adherence.

4. Hill-Bone Compliance Scale

- A 14-item self-report scale that assesses patients' adherence behavior and attitudes.
- Scores range from 0 to 14, with higher scores indicating better adherence. (7)

5. Medication Adherence Scale (MAS)

- A 4-item self-report scale that assesses patients' adherence behavior and attitudes.
- Scores range from 0 to 4, with higher scores indicating better adherence. (7)

6. Self-Efficacy for Appropriate Medication Use Scale (SEAMS)

- A 13-item self-report scale that assesses patients' confidence in their ability to take their medications as prescribed.
- Scores range from 0 to 130, with higher scores indicating greater self-efficacy.

7. Beliefs about Medicines Questionnaire (BMQ)

- An 18-item self-report scale that assesses patients' beliefs about their medications.
- Scores range from 0 to 72, with higher scores indicating more positive beliefs. (8)

8. The Adherence Scale

- A 6-item self-report scale that assesses patients' adherence behavior and attitudes.
- Scores range from 0 to 6, with higher scores indicating better adherence. (8)

Morisky Medication Adherence Scale (MMAS)

The Morisky Medication Adherence Scale (MMAS) is a widely used, self-report measure of medication adherence. It was developed by Donald E. Morisky and colleagues in 1986 to assess patients' adherence to medication regimens. (915)

Scale Description

The MMAS is an 8-item scale that assesses patients' adherence behavior and attitudes. The scale includes a mix of yes/no questions and Likert-scale items. The items are designed to evaluate patients':

1. Forgetfulness
2. Carelessness

3. Stopping medication when feeling better
4. Difficulty remembering to take medication
5. Difficulty taking medication as directed
6. Altering dosage
7. Stopping medication due to side effects
8. Taking medication exactly as prescribe

Scoring

The MMAS uses a simple scoring system:

- Yes/no questions: 1 point for "no" (adherent) and 0 points for "yes" (non-adherent)
- Likert-scale items: 1 point for each item rated as "always" or "often" (adherent)

The total score ranges from 0 to 8, with higher scores indicating better adherence. (9, 15)

Interpretation

The MMAS scores can be interpreted as follows:

- 8: High adherence
- 6-7: Medium adherence
- 0-5: Low adherence

Advantages

- 1. Easy to administer:** The MMAS is a brief, self-report measure that can be completed quickly.
- 2. Simple scoring:** The scoring system is straightforward and easy to interpret.
- 3. Widely used:** The MMAS has been widely used in various studies and clinical settings, making it a well-established measure.
- 4. Sensitive to change:** The MMAS has been shown to be sensitive to changes in adherence behavior over time.

Disadvantages

- 1. Subjective bias:** Patients may overreport or underreport their adherence behavior due to social desirability bias.
- 2. Limited accuracy:** The MMAS may not accurately capture adherence behavior in patients with complex medication regimens or those who use multiple medications.
- 3. Lack of objective validation:** The MMAS relies on patient self-report, which may not be validated by objective measures of adherence.

Applications

1. Clinical trials: The MMAS can be used to assess adherence in clinical trials and evaluate the effectiveness of interventions.

2. Clinical practice: Healthcare providers can use the MMAS to monitor patients' adherence and identify areas for improvement.

3. Research studies: The MMAS can be used in research studies to investigate factors associated with adherence and develop predictive models.

4. Disease management programs: The MMAS can be used to monitor adherence in disease management programs, such as diabetes, hypertension, or asthma management.

5. Medication therapy management (MTM): The MMAS can be used in MTM programs to assess patients' adherence and identify areas for improvement.

6. Clinical decision support systems: The MMAS can be integrated into clinical decision support systems to provide healthcare providers with adherence data and inform treatment decisions.

7. Patient education and counseling: The MMAS can be used to identify patients who may benefit from additional education and counseling on medication adherence.

8. Adherence-based payment models: The MMAS can be used to assess adherence in payment models that reward healthcare providers for improving adherence.⁶ Comparative effectiveness research: The MMAS can be used to compare the effectiveness of different medications or treatment regimens on adherence.

9. Patient-centered outcomes research: The MMAS can be used to assess the impact of adherence on patient-centered outcomes, such as quality of life and patient satisfaction.

10. Medication adherence apps: The MMAS can be integrated into medication adherence apps to track patients' adherence and provide personalized reminders and interventions.

11. Telehealth and remote monitoring: The MMAS can be used in telehealth and remote monitoring programs to assess adherence and provide timely interventions. (9,15)

Morisky 8-item Medication Adherence Questionnaire

Name:	Age:	Gender:
Department:	Id. No:	DOA:
		DOD:

S.NO	QUESTIONS	PRE-ASSESSMENT	POST-ASSESSMENT
1.	Do you sometimes forget to take your pills?		
2.	People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your medication?		
3.	Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it?		
4.	When you travel or leave home, do you sometimes forget to bring along your medication?		
5.	Did you take your medication yesterday?		
6.	When you feel like your symptoms are under control, do you sometimes stop taking your medicine?		
7.	Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
8.	How often do you have difficulty remembering to take your medication?		

score: 8= High adherence; 7 or 6 = medium adherence; 5= low adherence.

SCORE:

Yes: 0 point

No: 1 point

Factors Affecting Medication Adherence

Patient-Related Factors

1.Age: Older adults and young children may have difficulty managing complex medication regimens.

2.Cognitive Function: Patients with cognitive impairments, such as dementia or intellectual disability, may struggle with medication adherence.

3.Health Literacy: Patients with limited health literacy may have difficulty understanding medication instructions or managing side effects.

4.Motivation: Patients who are motivated to manage their condition and improve their health are more likely to adhere to their medication regimen.

5.Beliefs and Attitudes: Patients' beliefs and attitudes towards their medication, such as concerns about side effects or efficacy, can impact adherence. (4,12)

Medication-Related Factors

1.Complexity of Regimen: Medication regimens that are complex, involve multiple medications, or

have frequent dosing schedules can be difficult for patients to manage.

2.Side Effects: Medications with unpleasant or severe side effects can lead to non-adherence.

3.Cost: Medications that are expensive or not covered by insurance can be a barrier to adherence.

4.Formulation: Medications that are difficult to administer, such as injections or topical creams, can impact adherence.

Healthcare Provider-Related Factors

1.Communication: Poor communication between healthcare providers and patients can lead to misunderstandings about medication instructions or side effects.

2.Patient-Provider Relationship: A positive and supportive patient-provider relationship can improve adherence.

3.Provider Knowledge: Healthcare providers who are knowledgeable about medications and their

potential side effects can better support patients with adherence.

System-Related Factors

1. Access to Healthcare: Patients who have limited access to healthcare services or medications may struggle with adherence.

2. Insurance Coverage: Patients who have inadequate insurance coverage or high copays may be unable to afford their medications.

3. Pharmacy Services: Pharmacies that offer services such as medication therapy management or adherence counseling can support patients with adherence. (4,12)

Socioeconomic Factors

1. Socioeconomic Status: Patients from lower socioeconomic backgrounds may face barriers to adherence due to limited access to healthcare or financial resources.

2. Education Level: Patients with lower education levels may have difficulty understanding medication instructions or managing side effects.

3. Social Support: Patients who have a strong social support network may be more likely to adhere to their medication regimen.

Environmental Factors

1. Home Environment: Patients who live in chaotic or unstable home environments may struggle with adherence.

2. Work Schedule: Patients who have busy work schedules or irregular work hours may find it difficult to manage their medication regimen.

3. Travel: Patients who travel frequently may forget to take their medications or have difficulty accessing their medications while away from home.

Technology-Related Factors

1. Electronic Health Records: Electronic health records can improve adherence by providing patients with access to their medication lists and dosing schedules.

2. Mobile Apps: Mobile apps can support adherence by sending reminders, tracking medication use, and providing education about medications.

3. Automated Dispensing Systems: Automated dispensing systems can improve adherence by providing patients with a convenient and organized way to manage their medications. (4)

1. Medication Adherence is determined by face-to-face interview by asking questions from the 8-item Morisky Questionnaire.

2. Participants were characterized according to the following scores: Yes: 0 point, No: 1 point

3. Medication Adherence is characterized according to the score:

8= high adherence; 7 or 6= medium adherence; 5≤ low adherence.

MEDICATION NON-ADHERENCE

Medication non-adherence, also known as medication non-compliance, is a significant public health concern that affects millions of people worldwide. It occurs when a patient fails to take their medications as prescribed by their healthcare provider, which can lead to reduced therapeutic effectiveness, increased risk of complications, and decreased quality of life.

Types of Medication Non-Adherence

1. Primary non-adherence: Patient fails to fill or pick up prescription.

2. Secondary non-adherence: Patient fills prescription but fails to take medication as directed.

3. Intentional non-adherence: Patient deliberately chooses not to take medication.

4. Unintentional non-adherence: Patient forgets or misunderstands medication instructions.

Factors Affecting Medication Non-Adherence: common factors that can affect medication non-adherence:

1. Patient-Related Factors

1. Lack of understanding: Unclear instructions or lack of knowledge about the medication.

2. Forgetfulness: Forgetting to take medication due to busy schedules or lack of reminders.

3. Cost and affordability: High medication costs or lack of insurance coverage.

4. Side effects: Experiencing unpleasant side effects or fearing potential side effects.

5. Lack of motivation: Feeling overwhelmed or unmotivated to manage a chronic condition.

6. Denial or lack of acceptance: Denying or not accepting the diagnosis or the need for medication.

7. Mental health issues: Depression, anxiety, or other mental health conditions that affect adherence.

8. Cognitive impairment: Difficulty remembering or understanding medication instructions due to cognitive impairment.

2. Healthcare System-Related Factors

1. Complexity of regimen: Multiple medications or complex dosing schedules.

2. Lack of communication: Poor communication between healthcare providers, patients, or caregivers.

3. Inadequate support: Insufficient support or resources for patients to manage their medications.

4. Long wait times: Long wait times for appointments or medication refills.

5. Limited access: Limited access to healthcare services or medications.

3. Medication-Related Factors

1. Dosage frequency: Frequent dosing or complex dosing schedules.

2. Side effect profile: Medications with unpleasant or severe side effects.

3. Pill burden: Large numbers of pills or medications to manage.

4. Taste or texture: Unpleasant taste or texture of medications.

4. Social and Environmental Factors

1. Social support: Lack of support from family, friends, or caregivers.

2. Stigma: Stigma associated with the condition or medication.

3. Travel or relocation: Travel or relocation that disrupts medication routines.

4. Environmental factors: Environmental factors, such as lack of storage space or difficulty accessing medications.

Role of Pharmacists in Improving Medication Adherence in Paediatrics

The evaluation of the impact of pharmacists on improving therapeutic outcomes in pediatric inpatients is a vital area of healthcare research. Pediatric patients are particularly vulnerable due to their unique physiological characteristics, the complexity of drug dosing, and a higher risk of medication errors. Clinical pharmacists play a critical role in optimizing medication therapy, ensuring safety, and enhancing the overall quality of care in this population.

The introduction of pharmacists in pediatric inpatient settings has shown potential benefits such as improving medication adherence, reducing adverse drug events, ensuring accurate dosing, and providing education to healthcare providers and caregivers. By actively participating in patient rounds, reviewing prescriptions, and monitoring therapeutic responses, pharmacists contribute to a multidisciplinary approach to patient care. (3,11)

This evaluation aims to assess how pharmacists' interventions, such as medication reconciliation, therapy optimization, and patient-specific recommendations, can positively influence

treatment outcomes in hospitalized pediatric patients. Through systematic analysis, the study will shed light on the measurable impact of pharmacists on clinical outcomes, safety, and healthcare efficiency in pediatric care. (10,14)

Here are some ways pharmacists can make a positive impact:

A. Counseling and Education

1. Medication counseling: Pharmacists can provide personalized counseling to parents and caregivers on medication administration, potential side effects, and importance of adherence.

2. Patient education: Pharmacists can educate patients and families about their medications, including proper use, storage, and disposal.

B. Adherence Support

1. Adherence monitoring: Pharmacists can monitor patients' adherence through refill records, medication possession ratios, or other metrics.

2. Reminder systems: Pharmacists can help establish reminder systems, such as text messages or phone calls, to prompt patients to take their medications.

C. Collaboration with Healthcare Teams

1. Interdisciplinary collaboration: Pharmacists can work with pediatricians, nurses, and other healthcare professionals to develop comprehensive care plans that promote adherence.

2. Care coordination: Pharmacists can facilitate communication between healthcare providers, patients, and families to ensure seamless care transitions. (10,14)

D. Additional Strategies

1. Simplified medication regimens: Pharmacists can help simplify medication regimens by consolidating medications, reducing dosing frequencies, or switching to combination products.

2. Pediatric-friendly formulations: Pharmacists can recommend pediatric-friendly formulations, such as liquids or chewable, to make medication administration easier.

3. Technology-based solutions: Pharmacists can explore technology-based solutions, such as mobile apps or digital medication reminders, to support adherence.

II. MATERIALS AND METHODS

Study design:

Interventional

Study site:

The study was conducted community setting & Malla Reddy health city, Hyderabad, Telangana.

Study Period:

The study was conducted over a period of 3 months.

Study subjects:

Patients who met the following criteria were enrolled.

Inclusion Criteria:

- Patients (care givers) who are willing to participate in the study.
- Patients aged between 1 to 12 years.
- Only inpatients.

Exclusion Criteria:

- <1-year pediatrics.
- Patients (care givers) who are not willing to co-operate with the study.
- Patients (care givers) who do not provide proper information.

Data Source:

The data was collected offline.

Study procedure:

- A Data collection form was designed to know the demographics of the patient and the factors associated with medication nonadherence.
- 08-Item Morisky Medication Adherence Questionnaire was employed in the study to assess the treatment adherence.
- Consent form was given to the patient who are ready to participate in the study with the above inclusion criteria.

- The Patient's demographic data, reason for hospitalization, educational status, nutritional history, past medical history, past medication history, past surgical history, family history, social history, physical activity, factors associated with medication nonadherence were collected from individual patient.
- Current treatment regimen and other treatments with dose, frequency, route of administration date of administration is collected.
- Individual factors associated with medication non adherence assessment was done.
- Individual medication adherence assessment was done twice pre-pharmacist counselling (Morisky-1) and post-pharmacist counselling (morisky-2) to calculate adherence score.
- Data was analyzed for the appropriateness of results and reported.
- Statistical analysis was done. To identify the factors associated with non-adherence
- To provide effective patient counselling for patient care givers, guardians,
- To inform child's parents about the consequences of non-adherence to medication.
- To assess medication adherence adopted before and after counselling.
- To promote rational use of drugs and antibiotics in various walks of medical field.

Statistical analysis:

- The data were entered in Microsoft excel and data were analysed.
- Categorical data were presented as pie chart, bar column and quantitative data were analysed

III. RESULTS

A total of 50 subjects were enrolled in the study

PARAMETER 1

DISTRIBUTION OF PATIENTS BASED ON GENDER(N=50)

GENDER	NO. OF PATIENTS	PERCENTAGE(%)
MALE	28	56%
FEMALE	22	44%

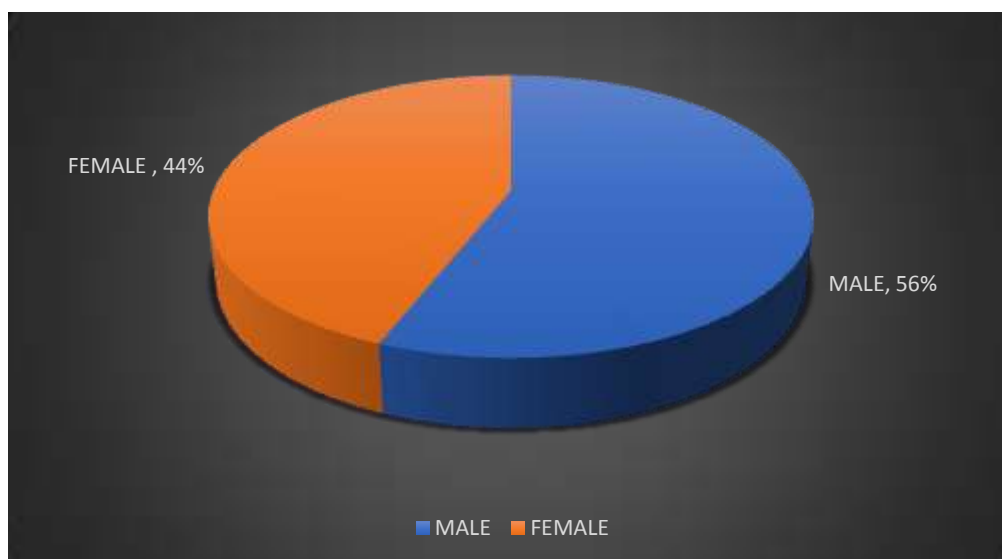


FIG 1. PERCENTAGE OF PATIENTS BASED ON GENDER

PARAMETER 2

DISTRIBUTION OF PATIENTS BASED ON AGE (N=50)

AGE	NO. OF PATIENTS
0-4 WEEKS	0
1 MONTH -12 MONTHS	8
1 YEAR-5 YEARS	24
6YEARS- 12 YEARS	18

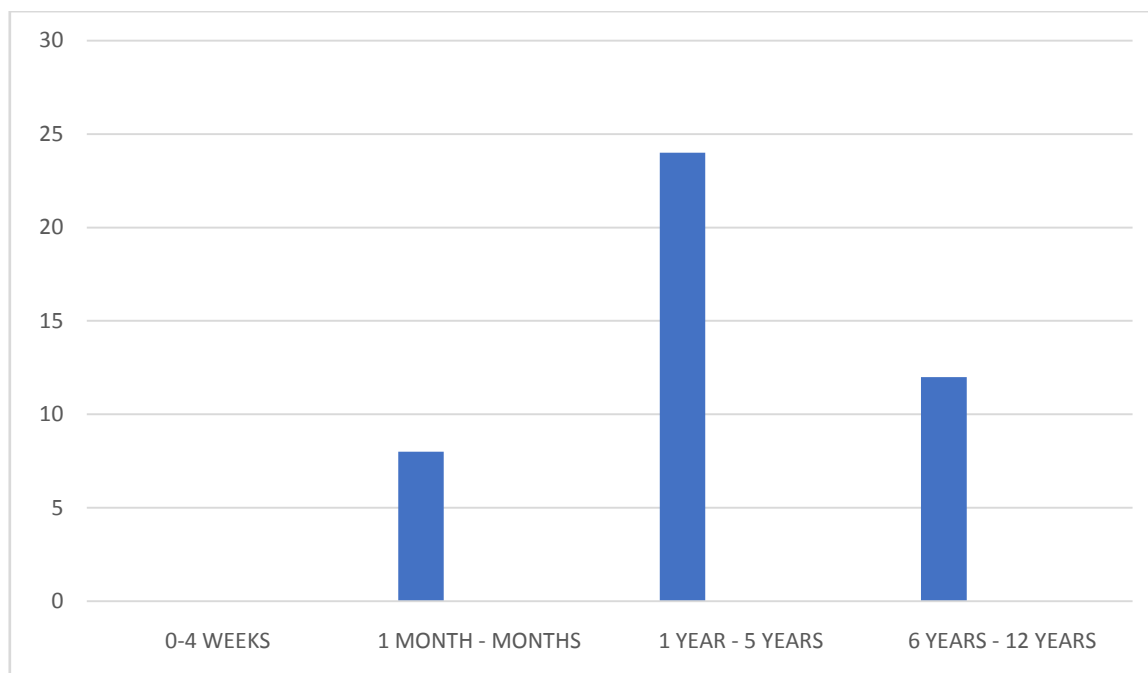


FIG 2. DISTRIBUTION OF PATIENTS BASED ON AGE

Out of 50 patients most patients are from the age group 1-5 years and no patients of age group 0-4 weeks

PARAMETER3.

DISTRIBUTIONS OF PATIENTS IN DIFFERENT BRANCHES

Branches	No of Patients
Respiratory	15
Neurology	11
Gastrointestinal	6
Renal	1
Diabetology	1
Others	18

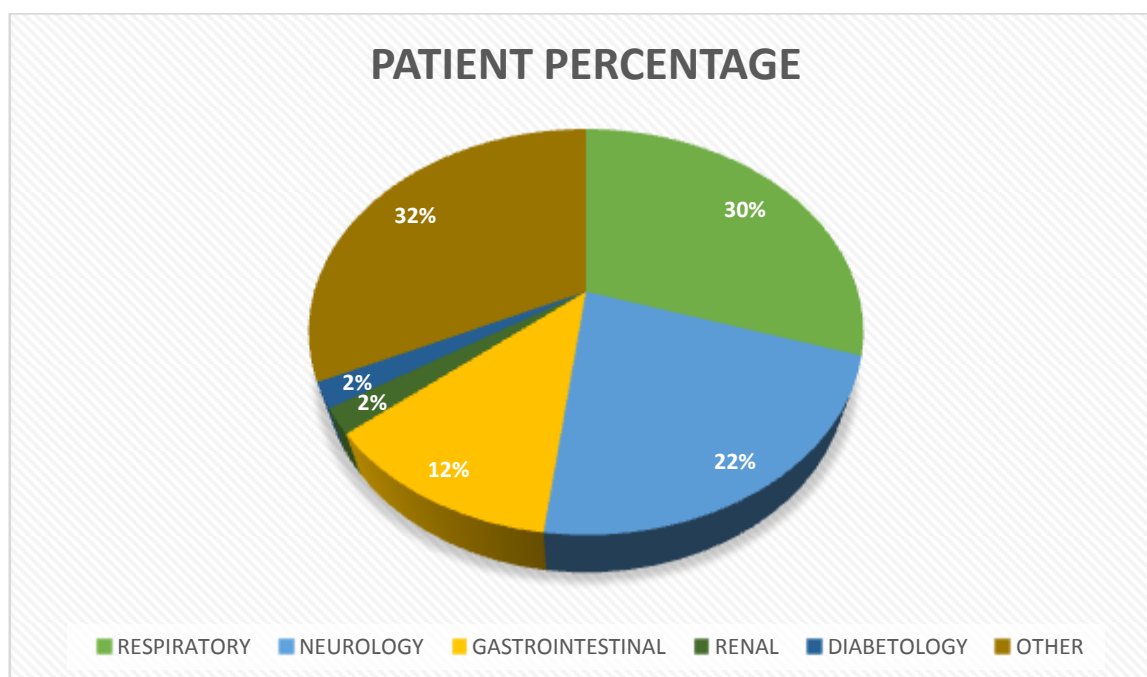


FIG 3. DISTRIBUTION OF PATIENTS IN DIFFERENT BRANCHES

Out of 50 patients 15 are in the Respiratory department, 11 are in Neurology department, 6 are in Gastrointestinal department, 1 each in Renal and Diabetology department and 18 are from other departments.

PRE AND POST COUNSELLING MEDICATION ADHERENCE RESULTS

ADHERENCE LEVEL	No. of Patients BEFORE COUNSELLING	No. of Patients AFTER COUNSELLING
Low adherence <5	20	16
Medium adherence 6-7	14	15
High adherence = 8	16	19

TABLE 4. MEDICATION ADHERENCE RESULTS

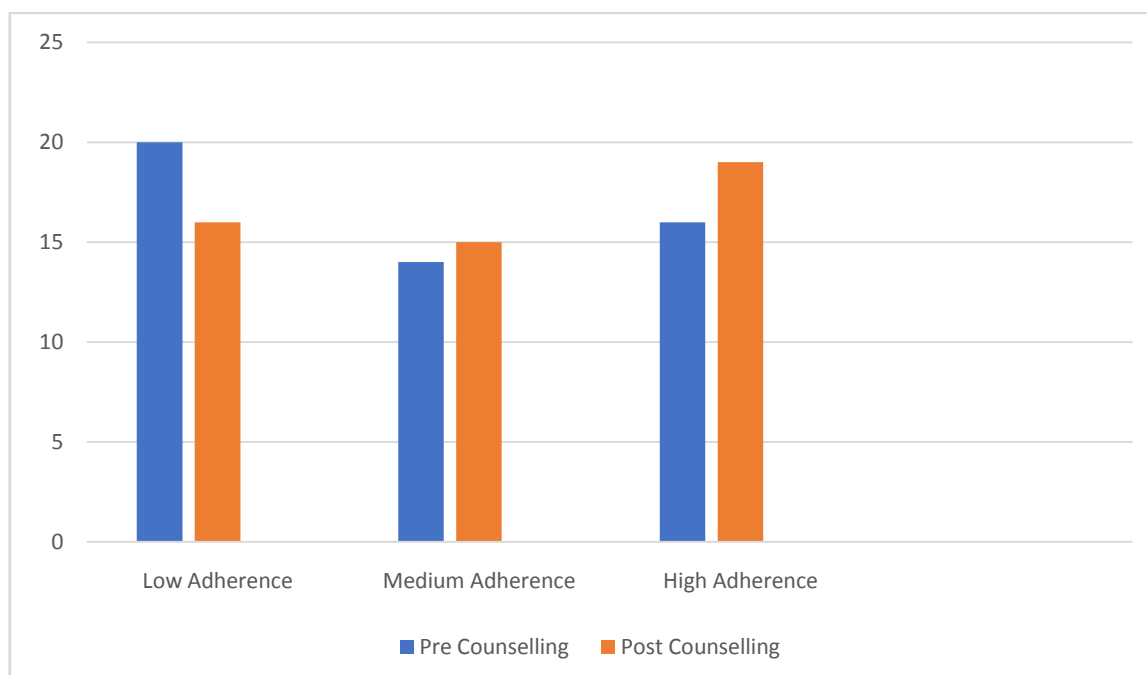


FIG 4. COMPARISION OF MEDICATION ADHERENCE

Out of 50 patients, low adherence was 20 before counseling, medium adherence was 14, and high adherence was 16. After counseling, low

adherence decreased to 16, medium adherence increased to 15, and high adherence increased to 19.

PAIRED T-TEST

Impact of pharmacist counseling on medication adherence by comparing medication adherence score before and after counseling.

Medication Adherence score	Before Counselling	After Counselling
Mean	5.98	6.27
Standard deviation	1.72	1.67

TABLE 5. MEDICATION ADHERENCE SCORE

This indicates an improvement in adherence after counseling

Out of 50 patients' medication score before counseling is 20 and after counselling shows improvement to 16. Standard deviation before counseling is 1.72 and after counseling is 1.67

TABLE 5. CONFIDENCE INTERVAL AND P VALUE

PAIRED TESTCONFIDENCE INTERVAL	T- P VALUE
95%	0.0023

Paired T test was applied to assess the difference in medication adherence score in patients of pediatrics before and after counselling.
• P Value of <0.05 is considered as significant.

Paired T test revealed that there exists a statistically significant difference in medication adherence score in paediatric patients before and after follow-up.

This study reveals the medication adherence was increased in paediatric patients after counselling by clinical pharmacist.

CONCLUSION

GENDER:

In relation to parameter 1, out of 50 patients 56% are males, and 44% are female. So

mostly are hospitalized due to various diseases when compared with.

DIAGNOSIS:

In relation to parameter 2, out of 50 patients 15 patients are diagnosed with viral pyrexia, 10 patients are diagnosed with simple febrile seizures, 7 patients are diagnosed with acute febrile illness, 6 patients are diagnosed with acute gastroenteritis, 3 patients are diagnosed with urti, 3 patients are diagnosed with seizures, 8 patients are diagnosed with respiratory tract infections, and other patients are diagnosed with acute tonsillitis, acute Urticaria, Aspiration pneumonia, grade 1 burns, iron poisoning, dehydration, cystitis, viral exanthem.

Most of the patients are diagnosed with viral pyrexia and seizures.

DISTRIBUTION OF PATIENTS BASED ON DIFFERENT BRANCHES:

In relation to parameter 3, out of 50 patients, 15 are from respiratory followed by neurology 11, gastrointestinal 6, renal and dermatology 2, and others 18.

AGE GROUP:

In relation to parameter 4 out of 50 patients, 8 patients are of 1-12 months, 24 patients are of 1-5 years, and 18 patients are of 6-12 years.

IV. DISCUSSION

High cost of medication, limited access to health care facilities, poor follow-up, decrease in symptom severity, forgetfulness, duration of therapy, and frequent dosing schedule were the most frequent reasons given by the participants as the reasons for their non-adherence to medication.

In a total of 50 patients, low adherence of 20 patients has been reduced to 16 patients, moderate adherence has been increased to 15 from 14 patients, high adherence has been increased to 19 from 16 patients after the pharmacist intervention which in accordance of study who conducted that adherence level has been improved from 32% to 38% in the study population after pharmacist intervention

A statistical PAIRED T-test was applied to assess the difference in medication adherence scores in patients before and after follow-up. Paired T-test revealed that there exists a statistically significant difference in medication adherence scores in patients before and after follow-up. The p-value = 0.002 (<0.05) which is statistically significant. This study reveals that medication

adherence was increased in patients after the pharmacist intervention.

V. CONCLUSION:

In our study, we concluded that medication non-adherence in pediatrics occurs for a variety of reasons and multiple factors like therapy-related factors, patient-related factors, condition-related factors, healthcare system factors, and socioeconomic factors. High cost of medication, limited access to health care facilities, poor follow-up, decrease in symptom severity, forgetfulness, duration of therapy, and frequent dosing schedule were the most frequent reasons given by the participants as the reasons for their non-adherence to medication. To avoid these barriers and to improve adherence educational intervention is needed. So, we did an educational intervention by counseling the patients about medications and their indications. There are many solutions to enhance medication adherence in the pediatric population which include individualized counseling, simplified regimens, the use of technology and strategies to improve taste, and advising tips to overcome factors affecting medication adherence.

Good communication with patients and families, educating them in health matters and treatment regimens leads to success of the therapy. Mainly pharmacist can help to address barriers for adherence and suggest ways to reduce them and counselling can lead to improve in health care of patients. The improvement in medication adherence has been observed descriptively and statistically.

A Significant improvement was observed during the study by the clinical pharmacist intervention. We as a clinical pharmacist provided patient counseling, it was achieved through personal face-to-face interaction, supply of patient information leaflet, and telephonic follow-up. This has created an awareness of the patient not only in appropriate use of medication and improved adherence.

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