WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 12, Issue 19, 701-717. Research Article ISSN 2277– 7105

ASSESSMENT OF MEDICATION COMPLIANCE AND ADHERENCE OF SYRUPS AND TABLETS IN PEDIATRIC GROUPS

Naveen Kumar S.*[1], Peter Lalhriathlua[1], Dr. Yogananda R.[2], Dr. Sowmya V. S.[3]

[1]Pharm. D. Intern,

[2]Professor and HOD, Department of Pharmacy Practice,

[3]Assistant Professor, Department of Pharmacy Practice,

S.J.M College of Pharmacy, Chitradurga, Karnataka-577502, India.

Article Received on
08 Sept. 2023,

Revised on 29 Sept. 2023,
Accepted on 20 Oct. 2023

DOI: 10. 20959/wjpr202319-30001

***Corresponding Author**
Naveen Kumar S.
Pharm. D. Intern, S.J.M College of Pharmacy, Chitradurga, Karnataka-577502, India.

ABSTRACT

Adherence to medication is the process by which patient take their medications as prescribed. Consequently, various deviations from the prescribed treatment are collectively called “non-adherence”. Due to its widespread, prevalence and serious consequences, WHO considers this phenomenon to be a “global problem of striking magnitude”. Medication ineffectiveness puts patients at risk for catastrophic consequences and raises health-care expenses dramatically. Despite the fact that non-adherence in paediatrics is quite common, efforts to reduce the cost of paediatric health care may prove to be just as successful as adult-focused treatments. However, this has not yet been researched. A lack of agreement between a patient's self-management techniques and medical or health advice is referred to as non-adherence. Since many pediatric patients do not follow their physicians' plans, noncompliance with medication is one of the most common difficulties that physicians have to deal with. **Objectives:** The present study was undertaken to determine the level of medication compliance and adherence among pediatric groups of syrups and tablets. **Materials and Methods:** A Prospective Observational study was conducted at tertiary care hospital, Chitradurga. The study was carried out over a period of six months. Questionnaire was created and was forwarded to Pediatric Patients with syrups and tablets admitting in pediatric department. **Results:** Among 250 participants (n=250), 38 (15.2%) participants belongs to 0-3 years, 67 (26.8%) participants belongs to 4-6 years, 51 (20.4%)participants belongs to 7-9 years, 94 (37.6%) participants belongs to age group of 10-12 years. (n=250) 149 (59.6%) participants are male and 101 (40.4%) participants are female.

Among the study population only 110 (44%) were found to have compliance to medication while 140 (56%) does not have compliance to medication. Among the study population only 1146 (30.56%) were found to be non-adherence to their medication while 2461 (65.62%) were found to be adherence to their medication prescribed or treatment plan. **Conclusion:** The present study accentuate the significance of medication adherence and compliance for optimal therapeutic outcome. Lack of adherence and compliance to medication is highly associated with factors of management issues, multiple medication issues, belief issues regarding medication and so on. Thus a study such as ours brings forth the need and urgency of providing awareness and education about the importance of medication adherence and compliance for better therapeutic outcome.

KEYWORDS: Medication Adherence, Medication Compliance, Pediatric Patients.

1. INTRODUCTION

Adherence to medication is the process by which patient take their medications as prescribed.[1] Consequently, various deviations from the prescribed treatment are collectively called “non-adherence”. Due to its widespread prevalence and serious consequences, WHO considers this phenomenon to be a “global problem of striking magnitude”.

Adherence has been defined as “the extent to which a patient is taking his medication as prescribed by his healthcare providers”. Medication ineffectiveness puts patients at risk for catastrophic consequences and raises health-care expenses dramatically.[3,4] Despite the fact that non-adherence in paediatrics is quite common, efforts to reduce the cost of paediatric health care may prove to be just as successful as adult-focused treatments. However, this has not yet been researched.[5] A lack of agreement between a patient's self-management techniques and medical or health advice is referred to as non-adherence.[6]

The level to which a person's behaviour complies with medical or health recommendations is known as compliance in the context of healthcare. Simply put, compliance refers to a patient's willingness to abide by medical specialists' advice. These suggestions frequently involve both the use of drugs and alterations to one's lifestyle, such as proper nutrition and length of therapy, and prompt attendance at follow-up sessions.[7]

Only by capturing both implementation and persistence at once can adhesion, which includes both regularity and continuity of medicine taking, be adequately explained. Due to a variety

of circumstances that might affect drug use, medication adherence for a person receiving chronic treatment may change over time. Long-term measurement and medication appropriate physical exercise for children. Unfortunately, a lot of kids don't understand how important it is to listen to their doctor when it comes to maintaining their health. These criteria include other elements like pharmaceutical knowledge, prompt prescription filling, proper dosage, precise scheduling of doses, approximate order of taking drugs, appropriate adherence improvement are made more difficult by this. Five dimensions can be used to model the factors that influence drug adherence. The evaluation technique presents a second obstacle to gauging drug adherence. To determine the prevalence and forms of non-adherence, a straightforward, valid, and reliable approach is required.[8,9,10,11]

Numerous variables, including illness stage, virus strain, past treatment history, baseline viremia, and pharmacokinetic interactions, may all have a detrimental impact on the expected therapeutic outcomes. Among these concerns, insufficient treatment adherence must be noted.[12] Adherence to treatment is a potent predictor of effectiveness, both in clinical trials and cohort studies.[13,14] Non-adherence to highly active antiretroviral therapy (HAART) may result in treatment failure, resistance and cross resistance, and the spread of resistant viruses to other patients, restricting future therapeutic choices for both the person and the community.[15]

FACTORS INFLUENCING MEDICATION ADHERENCE AND NON-ADHERENCE

- **Providers' Factors:** Due to the demands of daily routines, clinicians may get preoccupied with disease dynamics and treatment alternatives, ignoring patients' acceptance of treatment methods, particularly when drugs are involved. This results in providers failing to adequately educate the patients about the formulation, timing, dosage, frequency, side effects, and costs of the prescribed medicine.
- **Patients' Factors:** Patients are the major stakeholders in health care, thus it is important to consider their requirements while dealing with prescription non-adherence.
- **Medication/Treatment Factors:** The medications' characteristics, including the pharmaceutical formulation, dosage, size, frequency of use, and the dosage forms of the drug (for example, tablets, capsule, powder, suspension, emulsion, syrup, injection, aerosol, and foam), can influence adherence. Cost, timing, and side effects could also be potential barriers to adherence.

APPROACHES TO IMPROVING MEDICATION ADHERENCE

- **Providers' Education:** The ability of patients to adhere to prescribed therapies/medications may be impacted by providers' instruction. To function as catalysts for drug adherence, providers must be well-versed in the characteristics of the pharmacological choices available for the condition being managed.
- **Communication:** Possessing communication and interpersonal skills that are infused with empathy, as well as acknowledging the patients' difficulty in utilising drugs for acute and chronic disorders, can help to increase compliance. This strategy can aid in reducing the unwanted consequences of amnesia.
- **Patients' Education:** A well-informed patient group is a surefire way to boost drug adherence. Knowledge of the consequences of failing to follow the physicians' medication-use guidelines might encourage compliance. Understanding the significance of attending mandatory clinic visits/routine follow-ups can also help to improve compliance.[16]

2. METHODOLOGY

Study design: This was a questionnaire based prospective observational study.

Study site: This study was conducted at tertiary care hospital, Chitradurga district.

Study period: This Study was conducted over a period of six months.

Study subject: Study included In-patient's of pediatric department in tertiary care hospital, Chitradurga district.

Inclusion criteria

- Children age below 12 years.
- Patients of both genders.
- Only Inpatients.
- Pediatric patient prescribed with syrups and tablets.

Exclusion criteria

- Severe drug dependency.
- Evidence of mental impairment.
- Out patients.
- Pediatric patient groups not prescribed with syrups and tablets.

Ethical approval: The study was approved by the Institutional Ethical Committee of S.J.M College of Pharmacy, Chitradurga district.

Vide No: 623/2022-23

Sources of data: Questionnaire based survey among Pediatric groups at tertiary care hospital, Chitradurga district.

Study procedure: The study started when the Institutional Ethical Committee (IEC) gave its approval. After receiving informed permission, patients who satisfied the inclusion criteria were recruited in the research. A self-designed questionnaire was prepared and validated from pediatric department HOD. The questionnaire was distributed among Patient groups at tertiary care hospital, Chitradurga district, Karnataka for a period of six month. Prospective observational study will be carried out. Data was collected from 250 patients who were age between ages 1-12 years. Data was collected by the investigators and confidentiality was maintained during the data collection process.

TOOLS FOR ASSESSMENT

There were three tools used in the current study as the following:

Tool 1: Description of Demographic Variables.

It comprised of items such as name, age, gender, complaints on admission and diagnosis.

Tool 2: Medication Adherence Scale

It consists of Medication Adherence test and 15 structured questions. The questions has an answer option of 'Yes', 'No' and Don't know. Verbal questions were also asked on different domains viz. management issues (4 questions), multiple medication issues (3 questions), belief issues with medications (4 questions), availability issues (2 questions), forgetfulness and inconvenience issues (2 questions).

Tool 3: Medication Compliance Scale

It consists of Medication Compliance test and 4 (four) different steps of questions. Step one: What can the patient manage. If the answer to each question is 'yes' it is unlikely that the patient requires additional compliance support. So they can proceed to step four: Which is assessor details of the result or outcome. If the answer to any of the questions is 'no' then they need to proceed to step two: which simple adjustments might be appropriate for the patients. They can go on to stage four if an adequate improvement can be achieved. If none of

the suggested modifications are suitable for the patient, go to step three: Which blister pack is appropriate for a monitored dosage system? The MDS method might not be appropriate if you gave any of the questions a no response. A 28-day MDS would be acceptable if the answer to each question is "yes." The patient has the option to consider, collect, or receive seven days. A yes-or-no response option is provided for the question.

SCORING PROCEDURE

Part-1

The Medication Adherence Scale is to assess the level of adherence to medication. It consists of 15 questions. Depending on the answer given 'No' is scored 0(Zero), 'Yes' as 1(One) and 'Don't know' option is scored as 2 (Two). Depending on the answers given in the verbal questions of different domains, the responses were scored as numerical values 0, 1, 2, 3 are assigned to each domains questions asked.

Part-2

Medication Compliance Scale consists of 4 (four) different steps of questions. Step one: What can the patient manage.Step two: Which simple adjustments might be appropriate. Step three: Which is a monitored dosage system blister pack.Step four: Which is assessor details of the result or outcome .Depending on the answer given 'No' is scored 0(Zero), 'Yes' as 1(One).

Statistical analysis: The collected data was entered and analysed by using Microsoft excel 2016 version. Descriptive method was applied to obtain the frequency and percentage.

2. RESULTS

A total of 250 responses were recorded in the study and they are analysed for the assessment of medication compliance and adherence of syrups and tablets. The questionnaire was designed to analyse the compliance and adherence in paediatric groups.

I. DISTRIBUTION OF DEMOGRAPHIC DETAILS.

1. Distribution of participants according to age

Among 250 participants (n=250), 38(15.2%)participants belongs to 0-3 years, 67(26.8%) participants belongs to 4-6 years, 51(20.4%) participants belongs to 7-9 years, 94 (37.6%) participants belongs to age group of 10- 12year as graphically presented in **Figure No: 1**

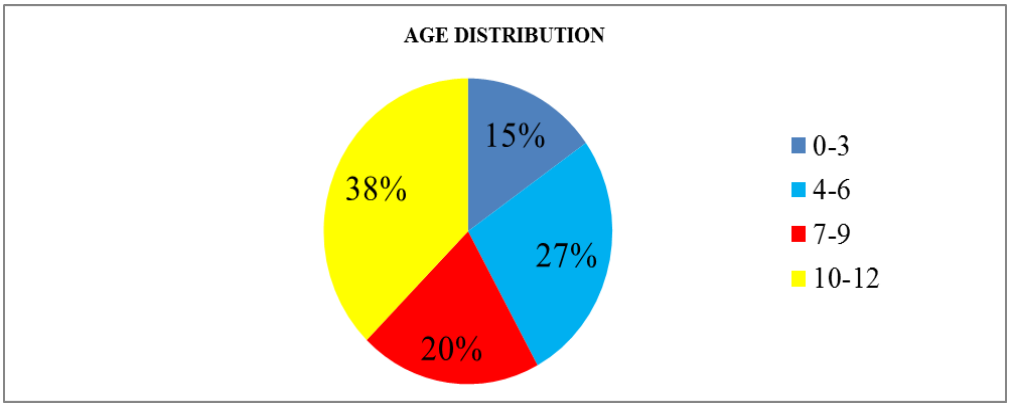

Figure No. 1: Distribution of participants according to age.

2. Distribution of participants according to gender

Among 250 participants (n=250), 149(59.6%) participants are male and 101 (40.4%) participants are female as graphically presented in **Figure No. 2**

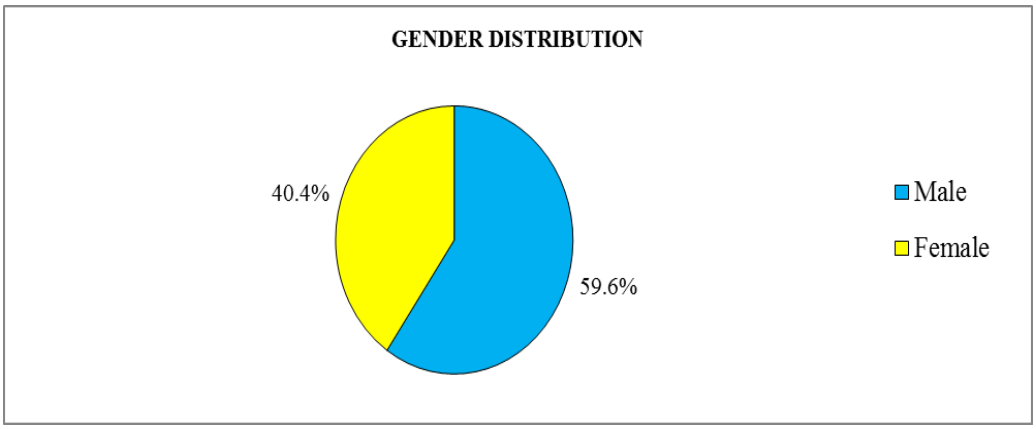

Figure No: 2 Distribution of participants according to gender.

II. ASSESSMENT OF MEDICATION ADHERENCE OF SYRUPS AND TABLETS IN PAEDIATRIC GROUPS

1. Responses of the participants about the question whether they are adherence to syrups and tablets.

Among 250 participants (n=250), (Q1)1(0.4%) of the responses show yes, 179(71.6%) of the responses show no and 70(28%) of the responses show don't know .(Q2) 2(0.8%)of the responses show yes,175(70%)of the responses show no and 73(29.2%)of the responses show don't know. (Q3)245(98%) of the responses show yes, 5(2%) of the responses show no and 0(0%) of the responses show don't know. The overall results are shown in mentioned in **Table No. 3**.

Table No. 3: Responses of the participants about the question whether they have adherence to syrups and tablets.

QUESTIONS	Yes Response		No Response		Don't know Response	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Do you think giving syrup and tablets beneficial for your child?(Q1)	1	0.4	179	71.6	70	28
After giving syrup and tablet, do you feel your child health has improved? (Q2)	2	0.8	175	70	73	29.2
Do you follow the physician's advice on giving medication to your child at correct time and dose?(Q3)	245	98	5	2	0	0

Out of 250 participants, the responses of questionnaires (Q3-Q15) recorded. The responses are shown in **Table No.4**.

Table No. 4: Responses of the participants about the question whether they are adherence to syrups and tablets.

QUESTIONS	Yes Response		No Response	
	Frequency	Percentage	Frequency	Percentage
Have you ever skipped giving medication to your child?(Q4)	3	1.2	247	98.8
Does your child immediately accept the medication?(Q5)	121	48.4	129	51.6
Has your child spitted or vomited syrup and tablet anytime?(Q6)	89	35.6	161	64.4
Have you ever face any kind of difficulties in administering syrup and tablet to your child?(Q7)	131	52.4	119	47.6
Do you know the medication of syrup and tablet prescribed to your child?(Q8)	220	88	30	12
Have you felt the given syrup and tablet is not working properly?(Q9)	15	6	235	94
Have you ever felt taking medication is not useful?(Q10)	7	2.8	243	97.2
Have you stopped the medication without physician's knowledge? (Q11)	3	1.2	247	98.8
Has your child avoided taking syrup and tablet?(Q12)	130	52	120	48
Have you ever forced your child to take medication?(Q13)	90	36	160	64

Do you follow any technique to give syrup and tablet?(Q14)	161	64.4	89	35.6
Do you follow hygienic practices while giving syrup and tablet to your child?(Q15)	249	99.6	1	0.4

III. MEDICATION ISSUES EVALUATION RESPONSE

2. MANAGEMENT ISSUES

The responses of management adherence issues are recorded. The difficulty swallowing medications has shown maximum YES response (K2,52.4%) followed by embarrassment in taking medications (K9,39.2%), Uncertainty about proper medication administration(K4,31.2%) and Problems opening the medication containers (K15,1.2%). The responses are shown in **Table No.5**.

Table No. 5: Management Issues Response.

Management issues	Yes Response		No response	
	Frequency	Percentage	Frequency	Percentage
Problems opening the medication containers (K15)	3	1.2	247	98.8
Embarrassment in taking medications (K9)	98	39.2	152	60.8
Difficulty swallowing medications (K2)	131	52.4	119	47.6
Uncertainty about proper medication administration (K4)	78	31.2	172	68.8

3. MULTIPLE MEDICATION ISSUES

The responses of Multiple medication adherence issues are recorded. The concerned about the long term effects of medications(K14,29.6%) has shown maximum response followed by consumption of too many medications (K7,43%) and cost of medications(K3,2.8%). The responses are shown in **Table No.6**.

Table No. 6: Multiple Medication Issues Response.

Multiple medication issues	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Concerned about the long term effects of medications (K14)	74	29.6	176	70.4
Consumption of too many medications(K7)	43	17.2	207	82.8
Cost of medications (K3)	7	2.8	243	97.2

3. BELIEF ISSUES WITH MEDICATION

The responses of belief issues with medication adherence issues are recorded. The Side effects or fear of side effects (K11,48%) has shown maximum response responses followed by Ineffective medications(K10,8.8%) and Unnecessary medications (K12,8%), Medication cessation to see if it is still needed(K13,1.6%). The responses are shown in **Table No.7**.

Table No. 7: Belief Issues with Medication Response.

Belief issues	Yes Response		No response	
	Frequency	Percentage	Frequency	Percentage
Ineffective medications(K10)	22	8.8	228	91.2
Side effects or fear of side effects(K11)	120	48	130	52
Unnecessary medications (K12)	20	8	230	92
Cessation to see if it is still needed (K13)	4	1.6	246	98.4

4. AVAILABILITY ISSUES

The responses of Availability adherence issues are recorded. The end of medication supply due to busy schedule (K6,1.2%) has shown maximum response responses followed by Medication unavailable in the pharmacy (K1,0.8%). The responses are shown in **Table No.8**.

Table No. 8: Availability Issues Response.

Availability issues	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Medication unavailable in the pharmacy (K1)	2	0.8	248	99.2
end of medication supply due to busy schedule(K6)	3	1.2	247	98.8

5. FORGETFULLNESS AND INCONVENIENCE ISSUES

The responses of Forgetfulness and inconvenience adherence issues are recorded. The inconvenience in taking medication as prescribed (K8,3.6%) %) has shown maximum response followed by forgetfulness in taking medications due to busy schedule (K5,1.6%). The responses are shown in **Table No.9**.

Table No. 9: Forgetfulness and Inconvenience Issues Response.

Forgetfulness	Yes Response		No response	
	Frequency	Percentage	Frequency	Percentage
Forgetfulness in taking medications due to busy schedule(K5)	4	1.6	246	98.4
Inconvenience in taking medication as prescribed (K8)	9	3.6	241	96.4

IV. MEDICINES COMPLIANCE TOOL

1. DETAILS OF PARTICIPANTS MANAGE EVALUATION RESPONSE

The overall results are shown in mentioned in **Table No. 10**.

Table No. 10: Details of Participants Manage Evaluation Response.

Patient manage	No response		Yes response	
	Frequency	Percentage	Frequency	Percentage
Understand each medicine dosage instructions? (MU1)	77	30.8	173	69.2
Understand the importance of each medicine? (MU2)	45	18	205	82
Understand how to take PRN (when required) medication (MU3)	122	48.8	128	51.2
Understand how to take variable doses (e.g. Warfarin?) (MU4)	110	44	140	56
Remember to take their medication regularly and at the appropriate time? (MM1)	56	22.4	194	77.6
Remember to order their repeat medication? (MM2)	125	50	125	50
Swallow all their tablets/syrups? (PSW1)	88	35.2	162	64.8
Open medicines boxes? (PD1)	16	6.4	234	93.6
Open blister strips? (PD2)	10	4	240	96
Open and close child-resistant lids? (PD3)	18	7.2	232	92.8
Open and close winged lids? (PD4)	18	7.2	232	92.8
Grip medicine bottles? (PSE1)	16	6.4	234	93.6
Halve tablets themselves (if required) (PSE2)	106	42.4	144	57.6
Read standard print labels?(PSE3)	118	47.2	132	52.8

2. DETAILS OF MEDICATION COMPLIANCE ADJUSTMENTS GIVEN

2.1 UNDERSTANDING ADJUSTMENTS

The Relative/carer prompts to take medication (2U4,30.4%)has shown maximum percentage of adjustment given followed by relative/carer prepares medications and prompts to take (2U5,23.2%), Simplify medication regime(2U2,16%), Provide a medication reminder sheet(2U1,12.4%), Medicines Use Review (2U3,8%). The responses are shown in **Table No.11.**

Table No: 11 Understanding Adjustments.

Understanding adjustments	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Provide a medication reminder sheet(2U1)	31	12.4	219	87.6
Simplify medication regime(2U2)	40	16	210	84
Medicines Use Review (2U3)	20	8	230	92

Relative/carer prompts to take medication (2U4)	76	30.4	174	69.6
Relative/carer prepares medications and prompts to take (2U5)	58	23.2	192	76.8

2.2 MEMORY ADJUSTMENT

The Relative/carer prepares medications and prompts to take(2M4,28.4%) has shown maximum percentage of adjustment given followed by relative/carer prompts to take medication(2M3,26.8%), Organise repeat prescription collection/delivery service (2M5,20.8%, Provide a medicines reminder sheet (2M1,5.2%), Simplify medication regimen(2M2,5.2%) Assistive technology e.g. Lifeline calling up to 4 times a day (2M6,3.2%). The responses are shown in **Table No.12**.

Table No. 12: Memory Adjustments.

Memory adjustment	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Provide a medicines reminder sheet (2M1)	13	5.2	237	94.8
Simplify medication regime (2M2)	13	5.2	237	94.8
Relative/carer prompts to take medication (2M3)	67	26.8	183	73.2
Relative/carer prepares medications and prompts to take(2M4)	71	28.4	179	71.6
Organise repeat prescription collection/delivery service (2M5)	52	20.8	198	79.2
Assistive technology e.g. Lifeline calling up to 4 times a day (2M6)	8	3.2	242	96.8

2.3 SWALLOWING ADJUSTMENT

Provide alternative formulations where appropriate (2SW1,26%) has shown maximum percentage of adjustment given followed by Simplify regimen to once daily/combination products (2SW2,16%), Refer to recommendations made by Speech and Language therapy(2SW3,2.8%). The responses are shown in **Table No.13**.

Table No. 13: Swallowing Adjustment.

Swallowing adjustment	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Provide alternative formulations where appropriate (2SW1)	65	26	185	74
Simplify regime to once daily/combination products (2SW2)	40	16	210	84
Refer to recommendations made by Speech and Language therapy(2SW3)	7	2.8	243	97.2

2.4 DEXTERITY ADJUSTMENT

The Relative/carer prepares medications and prompts to take (2D5,5.8%,) has shown maximum percentage of adjustment given followed by Dispense blister packed medicines into bottles (2D3,3.6%), Provide halved tablets Relative/carer prompts to take medication(2D4,3.6%), Provide screw/winged lids (2D1,0.4%), Provide large bottles/boxes (2D2,0.4%), Jar openers (2D6,0.4%).The responses are shown in **Table No.14**.

Table No. 14: Dexterity Adjustments Response.

Dexterity adjustment	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Provide screw/winged lids (2D1)	1	0.4	249	99.6
Provide large bottles/boxes (2D2)	1	0.4	249	99.6
Dispense blister packed medicines into bottles (2D3)	9	3.6	241	96.4
Provide halved tablets Relative/carer prompts to take medication(2D4)	9	3.6	241	96.4
Relative/carer prepares medications and prompts to take (2D5)	12	4.8	138	95.2
Jar openers (2D6)	1	0.4	249	99.6

2.5 SENSORY ADJUSTMENT

Provide large print labels(2SE1) has shown maximum percentage of adjustment given followed by Providesymbols on each box(2SE2). The responses are shown in **Table No.15**.

Table No: 15 Sensory adjustment response.

Sensory adjustment	Yes response		No response	
	Frequency	Percentage	Frequency	Percentage
Provide large print labels(2SE1)	74	29.6	176	70.4
Provide symbols on each box(2SE2)	54	21.6	196	78.4

V. DETAILS OF MEDICATION COMPLIANCE OUTCOME ASSESSEMENT

1. It is my opinion that this patient does not have a medicines compliance problem. The responses are graphically represented in **Figure No.16**

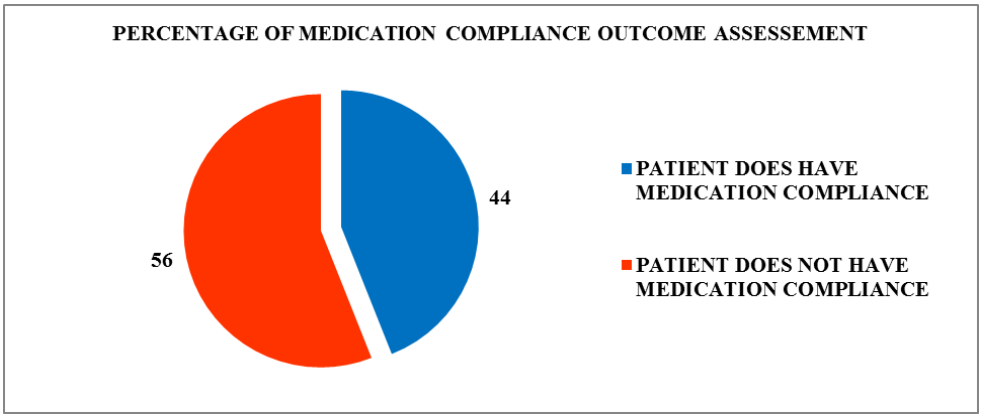

Figure No. 16: Details of Medication Compliance Outcome Assessment Response.

VI. DETAILS OF MEDICATION ADHERENCE OUTCOME ASSESSEMENT

1. Patient has medication adherence

3750 responses for (Q1-Q15) are related to patient's medication adherence in that 2461 (66%) responses show that patient is having medication adherence. Meanwhile 1146 (30%) responses show that the patient's does not have medication adherence. About 4% responses of the patient's does not give conclusion about their medication adherence. The responses are shown in **Table No.17**.

Table No. 17: Details of Medication adherence Outcome Assessment Response.

Outcome of Assessment	Frequency	Percentage
Patient have medication adherence.	2461	65.62%
Patient not have medication adherence.	1146	30.56%
Responses that does not give any conclusion.	143	3.81%
TOTAL	3750	100%

4. DISCUSSION

This study included 250 participants among which, 149 (59.6%) participants are male and 101 (40.4%) participants are female. Among the study population only 110 (44%) were found to have compliance to medication while 140 (56%) does not have compliance to medication. while 56% of the patients do not have medication compliance. Management issues such as problems opening the medication container (1.2%), embarrassment in taking medications (39.2%), difficulty swallowing medication (52.4%) and uncertainty about proper medication administration (31.2%) causes lack of adherence in the study population respectively.

A study such as ours brings forth the need and urgency of providing awareness and education about the importance of medication adherence and compliance for better therapeutic outcome.

The study conducted by **Warembourg M *et al.*, (2020)** States that non adherence to anti-infective drugs in pediatric patients because lack of knowledge among the parents and miss understanding about it. The results of our study also states the same.[17]

In our study males were more than females similar kind of data was obtained in the study conducted by **Ramawat *et al.*, (2020)** The same study 56% of patient were fully complained to the given treatment in adult in which education played and significant role but in our study pediatric patients compliance was 44% in which education status of the care taker was not evaluated. This variation in the result shows the need of evaluating education status and educating patient or care taker about the medication. Play an important role in the improving medication adherence.[18]

In a systematic review conducted by **Kathleen E *et al.*, (2014)** states the barriers for medication adherence was fear of side effects, incorrect dosing and forgetfulness. Our study also shows similar results and these barriers are preventable by educating the patient.[19]

5. CONCLUSION

From this study we get a conclusion that reduce medication compliance (44%) and adherence (66%) in pediatric groups is because of difficulty in swallowing medication, uncertainty about proper medication administration, concerned about the long term effect of medication, side effect or fear of side effects, knowledge in administrator. Belief issues with medication are found to be the prominent factor for medication non adherence among the pediatric patients. Patients having no medication compliance were provided with compliance tools for adjustments such as providing medication reminder sheet, simplifying medication regimen, providing alternative formulations where appropriate. The issues associated with lack of medication adherence and compliance if left unaddressed can result in factors contributing to severe progression of diseases and ailments. This study concludes that adherence and compliance is a very important aspect for optimal therapeutic outcome.

ACKNOWLEDGEMENTS

The writers would like to acknowledge everyone who took part in the study activity. The authors are also grateful to the administration, through the **principal of SJM College of Pharmacy**, for providing the required facilities to carry out this task. Our acknowledgement would be incomplete without thanking the biggest source of our strength, our **Family members.** Thank you everyone for the timely support and understanding.

6. REFERENCES

1. Vrijens B, De Geest S, Hughes DA, et al. ABC project team. A new taxonomy for describing and defining adherence to medications. Br. J Clin Pharmacol, 2012; 73(5): 691–705.
2. Adherence to long-term therapies. Evidence for action. World Health Organisation, 2003.
3. LeLeiko NS, Lobato D, Hagin S, et al. 6- Thioguanine levels in pediatric IBD patients: adherence is more important than dose. Inflamm Bowel Dis., 2013; 19(12): 2652–2658.
4. Osterberg L, Blaschke T. Adherence to medication. N Engl J Med., 2005; 353(5): 487– 497.
5. Newacheck PW, Taylor WR. Childhood chronic illness: prevalence, severity, and impact. Am J Public Health, 1992; 82(3): 364– 371.
6. Modi AC, Pai AL, Hommel KA, et al. Pediatric self-management: A frame work for research, practice, and policy. Pediatrics, 2012; 129(2).
7. Sheldon W, David OL, Adam LH, David T. How do you improve compliance? Pediatrics, 2005; 11(5): 718-724.
8. Baudrant-Boga M, Lehmann A, Allenet B. Thinking differently the patient medication compliance: from an injunctive posture to a working alliance between the patient and the healthcare provider: concepts and determinants. Ann Pharm Fr. 2012; 70(1): 15–25 French.
9. Schneider MP, Herzig L, Hampai DH, Bugnon O. Medication adherence in chronic patients: from its concepts to its management in primary care. Rev Med Suisse, 2013; 9(386): 1032–6 French.
10. Allenet B, Baudrant M, Lehmann A, Gauchet A, Roustit M, Bedouch P, et al. How can we evaluate medication adherence? What are the methods? Ann Pharm Fr., 2013; 71(2): 135–41 French.
11. Horne R, Weinman J, Barber N, Elliot R, Morgan M. Concordance, adherence and compliance in medicine taking. London: Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R & D., 2005.
12. Williams A, Friedl and G. Adherence, compliance, and HAART. AIDS Clin Care, 1997; 9: 51±58.
13. Montaner JS, Reiss P, Cooper D, et al. A randomized, double blind trial comparing combinations of nevirapine, didanosine, and zidovudine for HIV-infected patients: the INCAS Trial. Italy, the Netherlands, Canada and Australia Study. JAMA, 1998; 279: 930-937.

14. Kaufmann D, Pantaleo G, Sudre P, Telenti A. CD4-cell count in HIV-1 infected individuals remaining viraemic with highly active antirretroviral therapy (HAART). Lancet, 1998; 351: 723-724.
15. Cohen OJ, Fauci AS. Transmission of multidrug-resistant human immuno defeciency virus. The wake-up call. N Engl J Med., 1998; 339: 341-343.
16. Kardas P, Dabrowa M, Witkowski K. Adherence to treatment in paediatric patients–results of the nationwide survey in Poland. BMC paediatrics, Dec, 2021; 21(1): 1-2.
17. Warembourg M, Lonca N, Filleron A, Tran TA, Knight M, Janes A *et al.*, Assessment of anti-infective medication adherence in paediatric outpatients. European journal of paediatrics, Sep, 2020; 179(9): 1343-51.
18. Yashawant, R. *et al.*, 2020. Medication adherence: Assess compliance and associated factors among hypertensive patients. *Journal of Hypertension and Management*, 6(1).
19. Walsh KE, Cutrona SL, Kavanagh PL, Crosby LE, Malone C, Lobner K *et al*., Medication Adherence Among Paediatric Patients with Sickle Cell Disease: A Systematic Review. Paediatrics Journal, 2014; 134(6): 1175-83.