

Medication Adherence and Practices in Pediatric Patients

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Abstract

Background: Improper medication practices and non-adherence are the biggest challenges faced by pediatricians in outpatient practice. Hence this study was aimed at determining the medication practices and factors affecting adherence.

Methods: A cross sectional descriptive study was conducted at a tertiary care hospital in Southern India over a period of 3 months (January to March 2023), to study medication adherence and parental medication practices in pediatric patients. A pre structured questionnaire was administered to parents of 320 children.

Results: Majority of the parents (55%) had children aged 1-5 years of age. It was noted that most of the families (89%) were above poverty line (APL). About 34% parents were educated till graduate level and 17% were educated beyond post graduate level. Frequency of medication adherence in our study was found to be 78%. It was noted that parents with education of graduate level and above, those belonging to APL families and the ones with no fear of adverse drug reactions showed higher medication adherence as compared to other parents and this association was found to be statistically significant ($p < 0.001$). Majority of the parents (80%) reported that their children preferred liquid formulations, of which 57% preferred fruit flavoured ones. Around 51% parents preferred twice daily dosing of medications. While 47% parents used previous prescriptions, 39% bought over the counter medicines, especially paracetamol.

Conclusion: Knowledge about medication practices and factors affecting adherence is important in order to provide quality health care. Actively involving children and parents while prescribing medications with health education goes a long way in improving adherence.

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Introduction

Children are often thought of as “small adults”, however in reality, they are a heterogenous group that respond to medications very differently as compared to adults (1). Safe medication practices and adherence to treatment remain essential for adequate response and recovery in children (2).

Improper medication practices and non-adherence can cause serious consequences and is one of the biggest challenges faced by pediatricians in day to day outpatient practice (3,4). It is considered as a major problem not only in developing countries like India, but also in health care systems of developed countries like the United States (2). Unlike during inpatient care, where nursing staff ensure safe and timely delivery of parenteral or oral medications,

it becomes very difficult on outpatient basis to ensure medication adherence and the entire onus lies on parents or caregivers. Non adherence may further cause delayed response or worsening of acute illness and treatment failure or increased morbidity in long standing conditions (5-8).

Also, there are issues like half-finished medicine bottles, self-medication practices, usage of previously prescribed medicines, which need to be understood better to improve quality of care.

As there are not many studies on medication adherence in pediatric population, we conducted this study with the objectives of determining the frequency of medication adherence and identifying the associated factors in pediatric patients as well as to explore parental medication practices, so as to make an attempt to overcome these challenges and improve the quality of care.

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Methods

This Cross sectional descriptive study conducted in the pediatric outpatient department of Father Muller Medical College, Mangalore, Karnataka, India, was completed in 6 months which included 3 months of data collection, after obtaining institutional ethical committee approval (Ref No.: FMCMCIEC/CCM/626/2022).

A pre structured questionnaire developed by the investigating team was validated and refined by peers and subject experts.

Based on an Indian study (9) showing prevalence of high medication adherence to be 29%, with a precision of 5%, sample size was calculated as follows:

$$n = [DEFF * Np(1-p)] / [(d^2/Z^2(1-\alpha)/2 * (N-1) + p * (1-p))]$$

Hypothesized % frequency of outcome factor in the population (p) : 29%+5

Confidence limits as % of 100(absolute +/- %)(d): 5%

Design effect (for cluster surveys-DEFF) : 1

n = 317, final sample size rounded off to 320.

Parents or caregivers of children aged 1-15 years of age visiting the pediatric outpatient department and willing to be part of the study were selected by convenience sampling technique and administered the questionnaire regarding medication adherence and practices. Parents who did not consent and those submitting incomplete questionnaires were excluded.

Quantitative data collected was double-entered and analysed using EpiData version 3.1 for entry, version 2.2.2.182 (EpiData Association, Odense, Denmark) and SPSS (statistical package for social sciences) version 21.0 (IBM, Inc, Chicago, Illinois, USA) for analysis.

Odds ratio with 95% confidence interval (CI) was used to summarize the analytical output, while p < 0.05 was used to assess the statistical significance of association.

Results

Among the parents who participated in our study, 177(55%) had children aged 1-5 years, 110 (35%) had children aged 6-10 years and 33 (10%) of the parents had children aged 11-15 years. Mean age was 5.79+3.6 years. About 163 (51%) parents had boys while 157 (49%) parents had girls. Nearly 35 (11%) families belonged to lower socioeconomic strata (below poverty line- BPL) whereas the remaining 285 (89%) families were above poverty line (APL). About 107 (34%) parents had received education till graduate level, 54 (17%) parents had received education till post graduate level and beyond. 6 (2%) parents were illiterate.

Majority of the children [n=183 (57%)] preferred fruit flavored medications whereas 47(15%) children preferred medications without any flavor. Chocolate flavor was liked by 18%. Most of the children [n=257(80%)] preferred liquid formulations. Among these, almost all preferred rediuse suspension over reconstituted medications.

Most parents (81%) preferred to buy branded medications for their children. They believed that the branded ones were better in terms of quality and efficacy with a lower side effect profile due to their higher cost. On the contrary, among the 35 families belonging to BPL status, majority [n=26 (74%)] preferred generic medications due to financial constraints and this association of brand preference with socioeconomic status was found to be highly statistically significant (p<0.001) as shown in Table 1.

Table 1. Association of brand preference with socioeconomic status.

Social factors	Medication type			OR	95% CI	X ²	P value
	Branded	Generic	Total				
Socio-economic status	BPL	9 (26%)	26 (74%)	19.98	8.67-46.04	75.85	< 0.001, HS
	APL	249 (87%)	36 (13%)				

Table 2. Association of social factors with medication adherence.

Social factors		Course completion			OR	95% CI	X ²	P value
		Never	Always	Total				
SES	APL	53 (19%)	232 (81%)	285	3.68	1.77-7.64	13.55	< 0.001, HS
	BPL	16 (46%)	19 (54%)	35				
Education	Graduate and above	24 (15%)	137 (85%)	161	2.25	1.29-3.92	8.49	0.005, Sig
	Below graduate level	45 (28%)	114 (72%)	159				
Fear of adverse effects of medications	No	19 (11%)	150 (89%)	169	3.9	2.17-7.01	22.5	<0.001, HS
	Yes	50 (33%)	101 (67%)	151				

Almost 162 (51%) parents preferred twice a day dosing of medications for their children. Surprisingly around 38 (12%) parents preferred more frequent (> 3 times per day) dosing.

About 259 (81%) parents said that they usually read and check the instructions on the label, including the expiry date, before administering the medication to their children. Almost 149 (47%) parents admitted that they sometimes prefer using previous prescriptions to buy medicines especially for minor ailments like cough, cold and fever rather than visiting a doctor every time. All of these 149 parents mentioned that this practice has especially increased during and post the Covid-19 pandemic.

About 126 (39%) parents resorted to buying over the counter drugs and self-medication practices for their children, especially when they did not have a previous prescription, however it was seen that, this practice was predominantly restricted to paracetamol.

Around 92 (29%) parents believed in informing teachers about the medications being taken by their children and sending the medications along in order to not miss the afternoon dose. Almost 79 (25%) parents said that they carry all the necessary medications with them during travel and make sure the dose is not missed. As many as 61 (19%) parents said that they would rather prefer cancelling all commitments like school, travel and outings until the child gets better due to fear of missing the medication dose and prolongation of the illness.

Nearly 132 (41%) parents said that they often do a google search about medications and their effects before using it in their children. Quite surprisingly, only about 6 (2%) parents bought medicines online via e-pharmacy sites and applications, as the others seemed to lack knowledge and trust about the quality of medications sold online.

About 151 (47%) parents admitted to having fear of adverse effects to medications used in their children. Almost 251 (78%) parents followed all the instructions and completed the course of medications in their children as per their doctors' advice. Around 69 (22%) parents were found to be non-compliant.

It was noted that families belonging to higher socioeconomic status (APL) had nearly 4 times chances of following medication adherence as compared to those belonging to BPL status and this association was highly statistically significant (OR:3.68, $p<0.001$). Parents with education of graduate level and above were 2 times more likely to be adherent and this was found to statistically significant (OR:2.25, $p<0.005$). Parents who had no fear of adverse drug reactions in their children were almost 4 times more likely to be adherent and this association was highly statistically significant (OR:3.9, $p<0.001$) as shown in Table 2.

Discussion

Medication non adherence in children continues to pose a challenge to paediatricians. It may not only cause a delay in recovery but may also worsen the clinical condition further (2,3,4,6,10). Since there is a paucity of recent data on medication adherence in pediatric patients in the South Indian scenario, this study was conducted with the objectives of determining frequency of medication adherence and identifying the associated factors in pediatric patients as well as to explore parental medication practices.

The frequency of medication adherence in our study was around 78%. It was noted that majority of the parents, especially when it involved the health of their children, followed most of the instructions and completed the course of medications as per their pediatrician's advice. Around 22% of the parents were non adherent, especially once the acute symptoms subsided and their children showed some clinical improvement.

Similarly, a Korean study by Lim *et al.*, (11) reported a medication adherence in pediatric patients of around 80% and a study by Phelan *et al.*, (12) in asthmatic children reported an adherence rate of 70%.

In contrast, Conn *et al.*, (13) in their study conducted in Rochester, on parental beliefs and medication practices in their children showed an adherence rate as low as 22%. Chauhan *et al.*, (9) and Goudar *et al.*, (3) in two separate Indian studies on medication adherence also showed lower frequency of adherence around 29% and 38% respectively.

Some of the most important factors associated with good medication adherence in our study were higher level of education of the parents, families belonging to APL status and parents who had no fear of adverse effects of medications in their children. Similar findings were noted in three other studies by El-Rachidi *et al.*, (2), Freedman *et al.*, (14) and Ou *et al.*, (4) respectively. However, this was in disagreement with a study conducted by Goudar *et al.*, (3) where medication adherence was poor among families with parents who had a higher level of education, probably due to both parents being working professionals and having time constraints.

In our study, majority of the parents (80%) reported that their children preferred liquid formulations with fruit flavored medications being the most preferred flavor (57%) followed by chocolate flavor (18%). In contrast, chocolate was the most preferred flavor (85%) in a study conducted by Goudar *et al.*, (3).

A study by Chappell *et al.*, (1) also showed liquid formulation to be the most acceptable form. Gardiner *et al.*, (15) in their study, concluded that using sweetened or flavored medications improved the adherence rates.

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In our study, 37% of the parents preferred once a day dosing, 51% preferred twice a day dosing and 12% preferred dosing of 3 or more times per day for their children. Surprisingly, the parents who preferred more frequent dosing believed that for the medicine to be more effective and show faster results, it needs to be administered more frequently.

In contrast, Goudar et al., (3) in their study, reported that around 90% of the parents preferred once a day dosing of medications for their children.

Around 14% parents in our study did not follow dose adjustments during school and travel and ended up skipping the dose. In contrast, as per study conducted by Goudar et al., (3), as high as 93% parents had skipped doses of medications in their children at some point in time due to various commitments.

This was a single centre study and majority of the study participants belonged to Above Poverty Line families. Also, some of the parents may not have understood the questions clearly and hence might have given vague answers to please the interviewer, though they were told that there is no right or wrong answer. A multicentre study with a larger sample size covering wider regions could potentially give better answers.

Knowledge about medication practices and factors affecting adherence is important in order to provide quality health care. Several social factors, ingrained myths and fears often have a close association with medication adherence. Therefore, actively involving children and their parents while prescribing medications along with health education and counselling, goes a long way in improving medication adherence.

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Conflict of interest:

The author claims they have no financial or other conflicts of interest.

References

1. Chappell F. Medication adherence in children remains a challenge. *Prescriber*. 2015; 26(12): 31-4.
2. El-Rachidi S, La Rochelle JM, Morgan JA. Pharmacists and pediatric medication adherence: bridging the gap. *Hosp Pharm*. 2017; 52(2):124-31.
3. Goudar VR, Matti M, Kulkarni V. Factors affecting compliance of drug therapy in outpatient children. *Int J Contemp Pediatr*. 2019; 6(6): 2369-73.
4. Ou HT, Feldman SR, Balkrishnan R. Understanding and improving treatment adherence in pediatric patients. *Semin Cutan Med Surg*. 2010; 29(2): 137-40.
5. Shukla G, Tejus A, Vishnuprasad R, Pradhan S, Prakash MS. A prospective study to assess the medication adherence pattern among hypertensives and to evaluate the use of cellular phone text messaging as a tool to improve adherence to medications in a tertiary health-care center. *Ind J Pharmacol*. 2020; 52(4):290-5.
6. Santer M, Ring N, Yardley L, Geraghty AW, Wyke S. Treatment non-adherence in pediatric long-term medical conditions: systematic review and synthesis of qualitative studies of caregivers' views. *BMC Pediatr*. 2014; 14:63.
7. Matsui DM. Drug compliance in pediatrics: Clinical and research issues. *Pediatr Clin North Am*. 1997; 44(1): 1-14.
8. Archana S, Ram M. A prospective study on assessment of medication adherence of patients towards antihypertensive medications. *Res J Pharm Technol*. 2017; 10(11): 3779-82.
9. Chauhan S, Prasad PL, Khurana B, Gahalaut P. Self-reported medication adherence to antiepileptic drugs and treatment satisfaction among paediatric patients having epilepsy: A cross sectional study from the Indian subcontinent. *Sri Lanka J Child Health*. 2018;47(2): 129-36.
10. Kardas P, Dabrowa M, Witkowski K. Adherence to treatment in paediatric patients – results of the nationwide survey in Poland. *BMC Pediatr*. 2021;21(1): 16.
11. Lim JK, Lee YJ, Park JH. Medication – related knowledge and medication adherence in pediatric and adolescent patients with inflammatory bowel disease. *J Korean Med Sci*. 2020; 35(14):e92.
12. Phelan PD. Compliance with medication in children. *Aust Paediatr J*. 1984; 20:5.
13. Conn KM, Halterman JS, Fisher SG, Yoos HL, Chin NP, Szilagyi PG. Parental beliefs about medications and medication adherence among urban children with asthma. *Ambul Pediatr*. 2005; 5(5):306-10.

14. Freedman RB, Jones SK, Lin A, Robin AL, Muir KW. Influence of parental health literacy and dosing responsibility on pediatric glaucoma medication adherence. *Arch Ophthalmol.* 2012; 130(3): 306-11.
15. Gardiner P, Dvorkin L. Promoting medication adherence in children. *Am Fam Physician.* 2006; 74(5): 793-8.

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