

Prescriber's Perception, Knowledge and Attitude towards Prescribing Error in the Pediatric Ambulatory Care

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Abstract

Pediatricians are a special population with unique therapeutic needs due to their distinct pharmacokinetic/Pharmacogenetic makeup. The aim of the present cross sectional prospective study was to analyze / evaluate prescriber's perception, knowledge and attitude towards prescribing errors (PE) and rational prescribing within pediatric ambulatory care settings. 200 randomly selected general practitioners (RSGPs) at various public sector hospitals of Lahore were interviewed face to face by utilizing a semi quantitatively structured in depth data collection form. 92.5% were not following any guidelines (off label use of drugs) regarding prescription writing and 70.5% believed and perceived that PE don't occur. 54.4% were unaware about WHO concept of RUD. 64% did not consider PE as precursor of ADR whereas 82% were totally unaware about the concept of pharmacovigilance. 99% never reported ADR. Majority appreciated the role of pharmacist in drug delivery system but only 2% were positive for association of pharmacist in prescribing. Extensive in depth training of all health care providers is indispensable to improve prescriber's perception and knowledge regarding the ongoing irrational prescribing practices.

Keywords: Pediatrics, Ambulatory-care, Perception, Prescriber, Prescribing error

INTRODUCTION

Pediatric care refers to the attainment of the optimum physical, emotional, and social health for neonates, infants and children below the age of 18 years. The American Academy of Pediatrics was founded in 1930 with the basic concept that children are a special population with diversified needs. Use of drugs among children is mainly off label. Clinical trials are not widely conducted either due to shortage of funds, ethical issues to test children or due to unique physiological/pharmacogenomic variants presented by pediatrics.

Ambulatory care, the core element of primary health care, is a specialized form of out-patient medical care delivered to the patients who do not require admission to a hospital for treatment. Ambulatory care may be provided at physician offices, hospital emergency departments, urgent care centers or non-medical institution-based settings (schools or prisons). Chronic disease state management may be sought with ambulatory care appointments. Ambulatory care visits can help to cut down overall hospital operating costs. X-rays, ultrasounds, biopsies or basic laboratory test may be conducted during a regular visit to the ambulatory clinic.

Common symptoms of patients being provided ambulatory care include respiratory infections, fever, pain, chest pain, GI disturbances etc [1, 2, 3].

Rational prescribing is aimed at reducing inappropriate prescribing practices and improving patient care [4]. The concept of right drug, right dose, right route, right time and right patient ensure rational drug therapy [5]. Physician related factors, as well as social, environmental and economic factors govern the rationality of a prescription. Errors in prescription writing can occur irrespective of the age, gender, medication, dose, route of administration, or indication [6]. Medication errors result as a consequence of irrational prescribing. Medication errors (especially prescribing errors) have an increased potential to cause harm within the pediatric population as compared to adult populations [7, 8]. Medication errors are believed to be the most prevalent type of medical error and are a significant cause of preventable adverse events [9,10,11,12]. "A clinically meaningful prescribing error occurs when, as a result of a prescribing decision or prescription writing process, there is an unintentional significant (a) reduction in the probability of treatment being timely and effective

or (b) increase in the risk of harm when compared with generally accepted practice”[13].

Irrational prescribing is a global problem and may also be regarded as "pathological" prescribing[14]. Irrational drug therapy can cause patient harm by exacerbation or prolongation of illness, distress and higher costs [15]. Prescriber’s viewpoint regarding their sense of responsibility, financial constraints and incentives, clinical workload and their perception of demanding patients can greatly influence quality of prescribing.[16]. A shift in the attitudes of some GPs is required before cost-effectiveness is incorporated in drug prescribing. Attitudes towards shared decision-making (supplementary prescribing) and responsible provision of therapy need to be assessed[17]. To overcome increasing drug cost in Pakistan, the need for generic prescribing should be stressed. However, the knowledge of dispensing doctors about generic medicines is sparse. [18]

Role of professionally competent clinical pharmacists with specialized training in pediatrics is pivotal. They can intercept potentially harmful pediatric prescribing errors [19] and serve as an indispensable source of information for prescribing physicians and nursing staff regarding rational prescribing practices. The American Society of Health System Pharmacists (ASHP) believes that pharmacists have a role in meeting the primary (ambulatory) care needs of patients by providing pharmaceutical care, through their expanded responsibilities in collaborative drug therapy management [20]. Unfortunately, within the public sector hospitals at Lahore, prescribing patterns do not always conform to these criteria. [21].

Quality of prescribing can be enhanced by improving the training, testing the competence of prescribers; controlling the environment in which prescribers perform and by using technology to provide decision support [22]. E- Prescribing or CPOE (computerized physician order entry system) can significantly improve quality of care. The volume of e-prescribing is correlated with perceptions that it enhanced job performance, whereas withdrawal is associated with perceptions of poor usability [23]. Guidelines are ineffective unless they are accompanied by either education or financial incentives [24]. Teaching prescribing has

become increasingly difficult, as drug therapy is becoming more complex. Improper prescription practices can only be improved if education regarding hazards of inappropriate drug use is provided at community level. [25]

It is reflected in a US study whereby it was reported that despite restriction under National guidelines, antibiotics were being unjustifiably prescribed at nearly 1 in 6 pediatric ambulatory care visits for asthma when the need for antibiotics is undocumented, equating to 1 million prescriptions annually in the United States. [26] Many drugs including topically administered drugs, sex hormones, antidepressants, hypnotics, cardiovascular drugs and NSAIDs are commonly being prescribed off-label in developed countries like Sweden. [27] We cannot stop off label use in paediatrics however a good drug use evaluation can create awareness of rationalising off-label situation. [28]

METHODS

A prospective study was conducted by questioning randomly chosen 200 general practitioners. Prescribers at different pediatric ambulatory clinics at four public sector hospitals of Lahore (Institute of Child Health & Children Hospital, Mian Muhammad Munshi Hospital, Services Hospital, and Shaukat Khanum Memorial Cancer Hospital & Research Center) were questioned. The study was carried over the duration of 2 months.

Inclusion and exclusion criteria: Factors influencing the prescriber’s perspective on prescribing within an ambulatory setting were analysed during the study while questions regarding prescribing for inpatients were excluded from the study.

Plan of work: Prescribers were asked to fill a semi quantitative data collection form relating to prescriber’s viewpoint on precursors of medication (prescribing) errors rational prescribing, RUD, off label prescribing, role of pharmacists regarding avoidance of drug related problems (DRPs) or adverse drug events (ADEs), etc.

RESULTS & DISCUSSION

The prescriber’s perspective/attitude regarding rational prescribing is presented in table 1 and represented graphically in fig 1-14.

Table 1: Prescriber's perspective/attitude regarding rational prescribing (n=200)

S#	Questions	Prescriber's perspective			
		Yes	No	*S/E	**D/K
1	Awareness about the term medication (including prescribing) errors	74.0%	12.5%	1.0%	12.5%
2	Knowledge about definition and description of prescribing errors.	7.5%	64.0%	16.0%	17.5%
3	Do you agree that many prescribing errors occur?	2.5%	70.5%	4.5%	22.5%
4	Awareness about clear guidelines for paediatric prescription writing	4.5%	85.0%	10.0%	0.5%
5	Do you follow any guidelines for paediatric prescription writing?	3.0%	92.5%	1.0%	3.5%
6	Awareness about WHO concept of RUD (Rational use of Drugs)	28%	54.0%	0%	18.0%
7	Are you in favor of hospital formulary system based upon cost effective generics?	43.0%	52.0%	3.0%	2.0%
8	Is cost a driving factor for choosing a drug for any particular indication?	4.0%	43.0%	35.5%	17.5%
9	Are you influenced by peer prescribing?	63%	9.0%	28%	0%
10	Do you agree that prescribing is guided / influenced by pharmaceutical companies?	64%	27%	0%	9%
11	Non availability of complete past patient history adversely affects the quality of prescribing	85%	13%	2%	0%
12	Do you agree that mother is the most vital partner in ambulatory infant care for achieving best clinical outcome?	99%	0%	0.5%	0.5%
13	Do you regard / accept prescribing errors as a precursor of ADR?	19%	64%	7%	10%
14	Involvement of pharmacist during prescribing.	2.0%	85.0%	13.0%	0%
15	Is Cross check of prescription by pharmacist beneficial?	28.0%	18.5%	47.5%	6.0%
16	A competent and skilled pharmacist is beneficial for ultimate patient care in public sector hospitals of Pakistan?	72%	9%	10%	9%
17	Awareness about the term pharmacovigilance?	9%	82%	9%	0%
18	Did you ever report any ADR?	1%	99%	0%	0%

*S/E: some extent; **D/K: don't know

Prescriber's perspective regarding rational prescribing practices

74% of the prescribers perceived that they were aware about the term medication errors including prescribing errors (fig 1). However, majority of the prescribers (64%) were unable to describe prescribing errors whereas 17.5% were unaware about prescribing errors. Only 7.5% of the prescribers came up an elaborate description of the term (fig 2). 70.50% of the prescribers did not believe that prescribing errors occur (fig 3). 85.0% doctors were unaware about clear guidelines for paediatric prescription writing (fig 4) whereas 92.5% were not following any guidelines for paediatric prescription writing (fig 5). Awareness about WHO concept of RUD was only 28% (fig 6) whereas 52% did not favor hospital formulary system. 43% of the prescribers were in favour of hospital formulary system, since it helps to cut down overall expenses of the system (fig 7). 52% of prescribers stated that

cost was not a driving factor for choosing a drug for any particular indication in children. Only 4% of the prescribers stressed the importance of cheaper generics for any particular indication. Furthermore, 17.5% did not consider cost while prescribing (fig 8). 91% (63% +28%) of prescribing was influenced by peer either fully or partially (fig 9). It is interesting that 64% prescribers were impressed and influenced by advertisements by pharmaceutical companies (fig 10). 85% prescribers perceived that non availability of complete past patient history adversely affects the quality of prescribing (fig 11). 99% believed that mother was the most vital partner in ambulatory infant care for achieving best clinical outcome (fig 12). 64% prescribers disagree that prescribing errors may act as precursor of ADR. (fig 13). Majority of the prescribers (85%) were not welcoming for adding pharmacist in prescribing team. There were apprehensions / biases regarding the professional skills of competent and qualified

pharmacists (fig 14). However, a good number 28% (fully) and 47.5% (partially) appreciated / supported cross check of prescription by pharmacist (fig 15). The consultant doctors were more welcoming for pharmaceutical intervention as compared to in experience new doctors. 82% of the prescribers were totally unaware about the term Pharmacovigilance (fig 17). 99% of the prescribers had never reported any ADR. Fear of accountability and disgrace among peers is perceived to be the major driving factor behind non-reporting of ADR (fig 18).

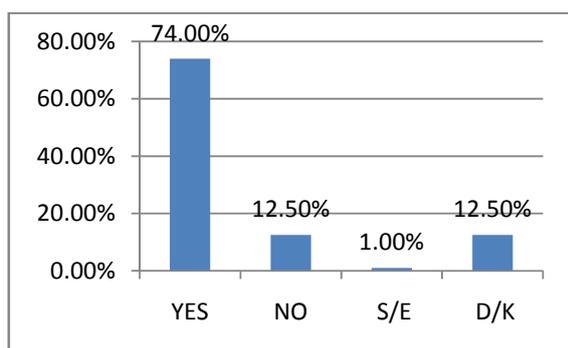


Fig 1: Awareness about the term medication (including prescribing) errors.(n=200)

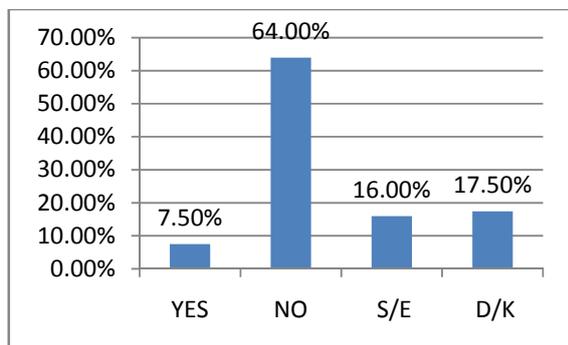


Fig 2: Knowledge about definition and description of prescribing errors.(n=200)

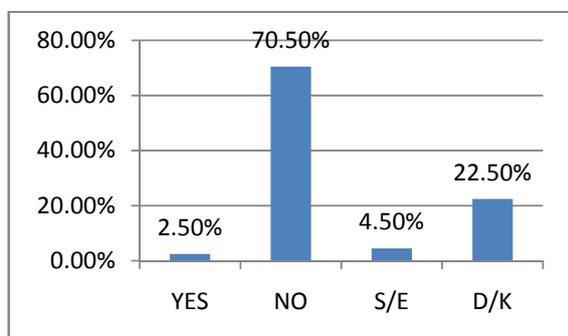


Fig 3: Do you agree that many prescribing errors occur?(n=200)

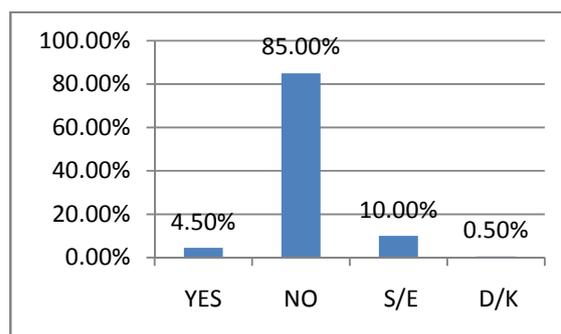


Fig 4: Awareness about clear guidelines for pediatric prescription writing?(n=200)

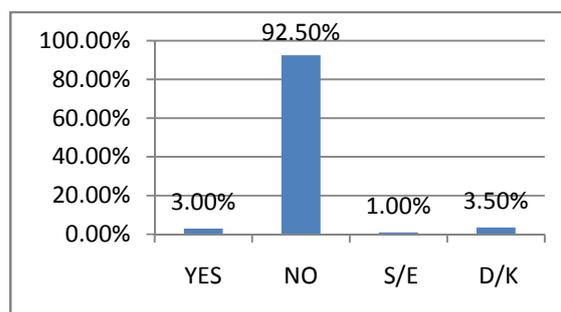


Fig 5: Do you follow any guidelines for pediatric prescription writing?(n=200)

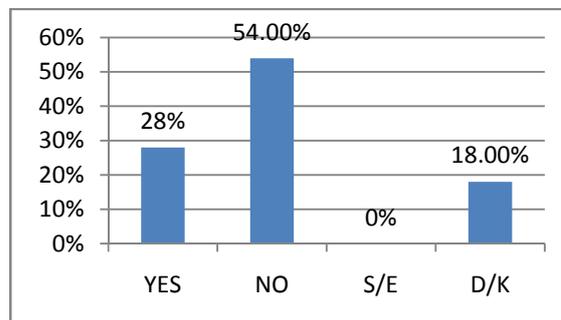


Fig 6: Awareness about WHO concept of RUD (Rational use of Drugs)?(n=200)

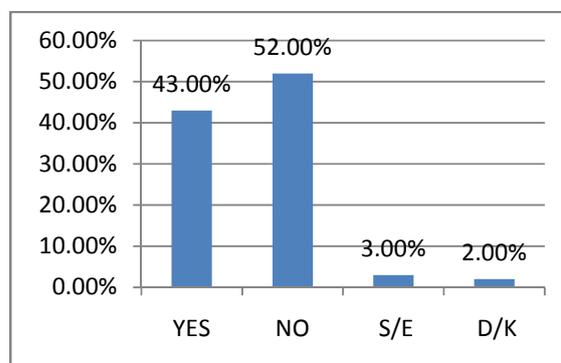


Fig 7: Are you in favor of hospital formulary system based upon cost effective generics?(n=200)

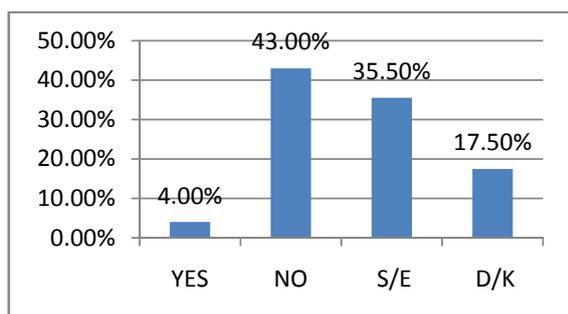


Fig 8: Is cost a driving factor for choosing a drug for any particular indication?(n=200)

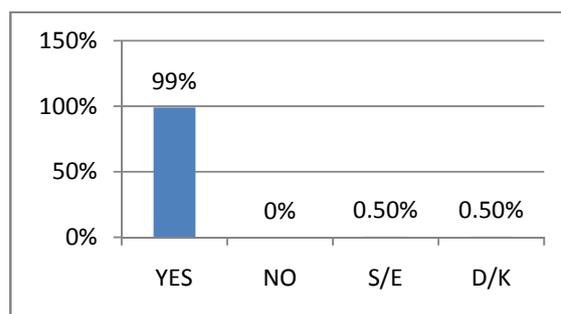


Fig 12: Do you agree that mother is the most vital partner in ambulatory infant care for achieving best clinical outcome?(n=200)

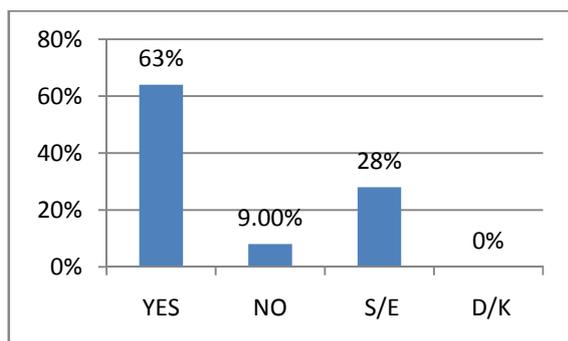


Fig 9: Are you influenced by peer prescribing?(n=200)

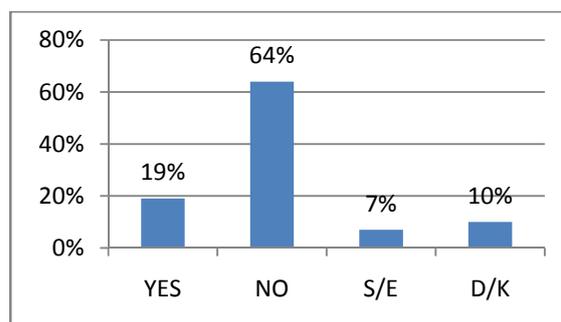


Fig 13: Do you regard / accept prescribing errors as a precursor of ADR?(n=200)

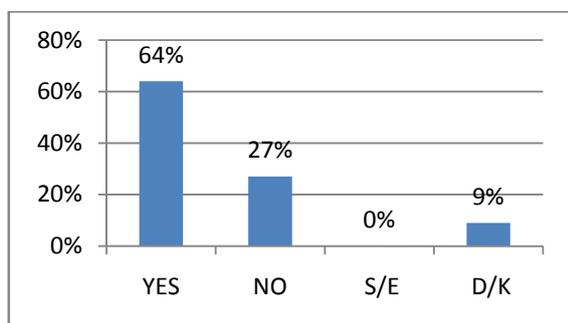


Fig 10: Do you agree that prescribing is guided / influenced by pharmaceutical companies?(n=200)

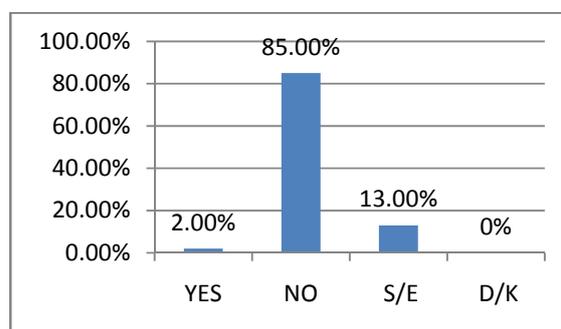


Fig 14: Involvement of pharmacist during prescribing.(n=200)

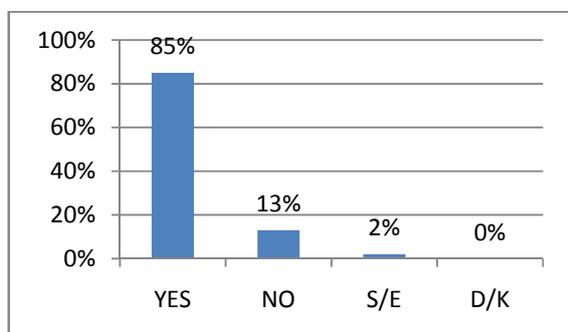


Fig 11: Non availability of complete past patient history adversely affects the quality of prescribing.(n=200)

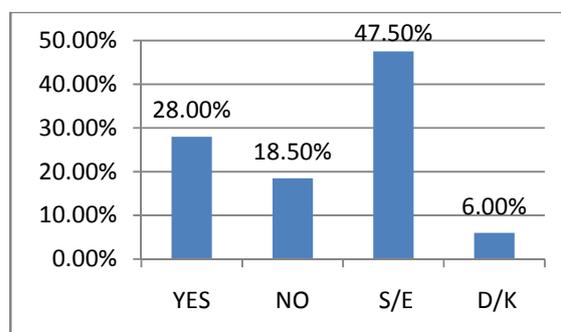


Fig 15: Is Cross check of prescription by pharmacist beneficial?(n=200)

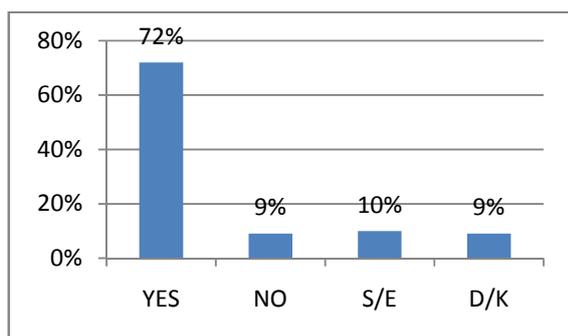


Fig 16: A competent and skilled pharmacist is beneficial for ultimate patient care in public sector hospitals of Pakistan? (n=200)

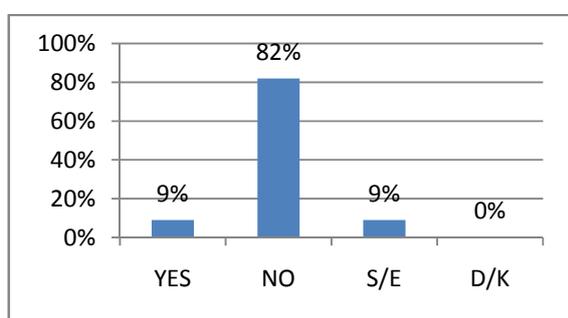


Fig 17: Awareness about the term pharmacovigilance? (n=200)

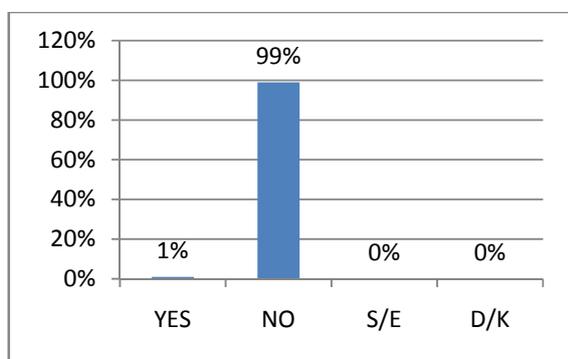


Fig 18: Did you ever report any ADR?(n=200)

As per information available on website of WHO on 1 November 2011 “Each year 7.6 million children under the age of five die worldwide. Pneumonia, diarrhea, malaria and health problems during the first month of life are the main cause of mortality. This updated fact sheet shows how more than two-thirds of these deaths could be prevented through simple and inexpensive interventions”

CONCLUSION AND RECOMENDATION

Decision making in rational prescribing is a complex, intricate process involving a balance between effectiveness and risks associated with quality drug therapy. Gaps in knowledge of the doctor with respect to rational drug use results in deficiencies during prescription writing. Quality of individual prescriptions is greatly influenced by the perceptions of doctors regarding social background, beliefs, attitudes, and expectations of the patient, as well as the uncertainty of the diagnosis. Failure to ascertain patients' expectations is a major reason why practitioners prescribe more drugs in total than patients expect. Inappropriate prescribing practices among pediatric ambulatory care settings remain unnoticed and are continuous ongoing phenomenon till now all over the globe. An adequate system of reporting of information should be developed so as to formulate standard treatment guidelines.

Implementation of following recommendations can significantly raise awareness and improve prescriber's viewpoint regarding rational prescribing practices:

1. Training in the light of WHO guidelines should be given to all health care providers regarding RUD, DRP, Pharmaceutical Care and Pharmacovigilance.
2. The Prescription should state what is to be given to whom and by whom prescribed, and give instructions on how much should be taken how often, by what route and for how long or total quantity supplied
3. Concerted efforts in the face of educational activities such as public awareness seminars and conferences are pivotal for the improving the prescriber's knowledge and perspective.
4. Prescribers should be appreciated to report potential ADRs. A root cause analysis of each and every serious error or adverse event should be done.
5. A proper and self-explanatory definition of prescribing error suited to Pakistan must be developed
6. Medical journals, scientific conferences and postgraduate meetings can be used to influence GPs regarding desired prescribing practices
7. Advertisement / Promotion of drug or drug related products by pharmaceutical companies must be ethical and strictly controlled.
8. Doctors must be informed about the cost effectiveness of cheaper generics.

9. All health care provider (including doctors, pharmacist and nurses) must co-operate and coordinate in order to carry out collaborative patient care for the best patient interest.
10. Patient or his care giver must be engaged during decision making about care and drug therapy. His rights to choose must be respected.
11. Off label use of medicines must be evaluated through drug utilization evaluation in order to ensure safe and effective delivery of drug therapy in pediatric ambulatory care.
12. There is a dire need to develop guidelines for use of medicines in ambulatory patient care.
13. All manufacturers must be bound to give guideline regarding use or not use of medicines in the direction circular/insert in the pack.
14. Culture of transparency and honesty must be developed in communication of ADEs.

REFERENCES

1. Rosenblatt, R. A., D. C. Cherkin, R. Schneeweiss and L. G. Hart. The Content of Ambulatory Medical Care in the United States — AnInterspecialty Comparison *Engl J Med*; 1983. 309:892-897.
2. Bodenheimer, T.,E. H. Wagner and K.Grumbach. Improving Primary Care for Patients With Chronic Illness *JAMA.*, 2002. 288(15):1909-1914.
3. Kroenke, K. and A. D. Mangelsdorff. Common symptoms in ambulatory care: Incidence, evaluation, therapy, and outcome, *Am J Med.*, 1989. 86(3):262-6.
4. Crigger, N. and L. Holcomb. Improving Nurse Practitioner Practice through Rational Prescribing, *The Journal for Nurse Practitioners.*,2008. 4(2):120-125.
5. Khoja, T., N. A. Qureshi, Y. Neyaz, M. A. Magzoub, A. Haycox and T. Walley. Physicians' medication prescribing in primary care in Riyadh city, Saudi Arabia. Literature review, part 2: rational prescribing *EMHJ.* 2011. 17(2):132-9.
6. Vance, M. A. and W. R. Millington. Principles of irrational drug therapy . *Int J Health Serv.*, 1986.16 (3):355-62.
7. Aronson, J. K. Medication errors: what they are, how they happen, and how to avoid them *Q J Med.*, 2009.102(8): 513-521.
8. Williams, D. J. P. Medication errors *J R Coll Physicians Edinb.*, 2007. 37:343–346.
9. Dean, B., M. Schachter, C. Vincent and N. Barber. Prescribing errors in hospital inpatients: their incidence and clinical significance *QualSaf Health Care.*, 2002. 11(4): 340–344.
10. David, J., R. C. Anderson and S. Craig A systems approach to the reduction of medication error on the hospital ward. *Webster Journal of Advanced Nursing.*, 2001. 35(1);34-41
11. Perwitasari, D. A., J. Abror and I. Wahyuningsih. Medication Errors In Outpatients Of a Government hospital in Yogyakarta Indonesia. *International Journal of Pharmaceutical Sciences Review and Research*, 2010. 1(1) Article 002
12. Bobb, A., K. Gleason, M. Husch, J. Feinglass, P. R. Yarnold and G. A. Noskin. The Epidemiology of Prescribing Errors, the Potential Impact of Computerized Prescriber Order Entry., *Arch Intern Med.*, 2004. 164(7):785-92.
13. Bates, D. W., D. L. Boyle, M. B. V. Vliet, J. Schneider and L. Leape. Relationship between medication errors and adverse drug events. *J Gen Intern Med.*, 1995. 10(4):199-205.
14. Hogerzeil, H. V.Promoting rational prescribing: an international perspective. *Br J ClinPharmacol.*, 1995. 39(1): 1–6
15. Barber, N. What constitutes good prescribing?.*BMJ.*, 1995. 310: 923
16. Weiss, M. C. , R. Fitzpatrick, D. K. Scott and M. J. Goldacre. Pressures on the general practitioner and decisions to prescribe *Oxford JournalsMedicineFamily Practice.* 1996.13(5);432-438.
17. Jacoby, A., M. Smith and M. Eccles. A qualitative study to explore influences on general practitioners' decisions to prescribe new drugs. *Br J Gen Pract.* 2003.53(487): 120–125.
18. Jamshed, S. Q., M. A. A. Hassali, M. I. M. Ibrahim, Z. D. Babar. Knowledge Attitude and Perception of Dispensing Doctors regarding Generic Medicines in Karachi, Pakistan: A Qualitative Study. *JPMA.* 2011. 61 (1);80-83.
19. Wang, J. K., N. S. Herzog, R. Kaushal, C. Park, C. Mochizuki and S. R. Weingarten. Prevention of Pediatric Medication Errors by Hospital Pharmacists and the Potential Benefit of Computerized Physician Order Entry *Pediatrics.*, 2007.119:e77-85.
20. Scobie, S. D., M. Lawson, G. Cavell, K. Taylor, S. H. Jackson and T. E. Roberts. Meeting the challenge of prescribing and administering medicines safely: structured teaching and assessment for final year medical students. *Med Educ.* 2003.;37:434–7.
21. Gilley, J. Towards rational prescribing. *BMJ.*, 1994. 308(6931): 731–732
22. Barber, N., M.Rawlins and B.Dean, *Reducing prescribing error: competence, control and culture.* Quality and Safety in Health Care, 2003.12 (Supplement 1); 29-32.
23. Wang, C. J., M. H. Patel, A. J. Schueth, M. Bradley, S. Wu, J. C. Crosson, P. A. Glassman and D. S. Bell. Perceptions of Standards-based Electronic Prescribing Systems as Implemented in Outpatient Primary Care: A Physician Survey. *J Am Med Inform Assoc.* 2009.;16(4):493-502. Epub 2009 Apr 23.

24. Lim, P.Z., S. L. Tunis, W. S. Edell, S. E. Jensik and M. Tohen. Medication prescribing patterns for patients with bipolar I disorder in hospital settings: adherence to published practice guidelines. *Bipolar Disord.* 2001.;3:165–73.
25. Siddiqui, S., S. Hamid, G. Rafique, S. A. Chaudhry, N. Ali, S. Shahab and R. Sauerborn. Prescription practices of public and private health care providers in Attockdistrict.of Pakistan, *Int J Health Plann Mgmt.*, 2002.17: 23-40.
26. Nielson, D. W., M. D. Cabana, I. M. Paul, J. H. Maselli, A. L. Hersh, H. A. Boushey, Antibiotic Prescribing During Pediatric Ambulatory Care Visits for Asthma *Pediatrics* 2011. 127(6);1014;
27. Olsson, J., E. Kimland, S. Pettersson, and V. Odling. Paediatric drug use with focus on *off-label* prescriptions in Swedish outpatient care – a nationwide study. *ActaPaediatrica*, 2011. 100: 1272–1275.
28. Nydert, P., S. Lindemalm, A. Nemeth. Off-label drug use evaluation in paediatrics--applied to ciprofloxacin when used as treatment of cholangitis. *Pharmacoepidemiol Drug Saf.* 2011. 20(4):393-8.