

Medication compliance among children

Omar T Dawood, Mohamed Izham Mohamed Ibrahim, Subish Palaian

Penang, Malaysia

The compliance of medicine among children is one of many important issues that the health care providers should focus on. The noncompliance to medication is one of the common problems that were addressed by physicians since many pediatric patients do not follow their physicians' plan. This problem may lead to many implications concerning medicine use especially in children with acute or chronic diseases. Approximately 30%-70% of patients with chronic illnesses (e.g., epilepsy, asthma and diabetes) have poor adherence because of extended treatment duration, multiple medications, and periods of symptomatic remission.^[1-3] Clinical experience indicates that poor compliance is common among patients with chronic illnesses. Medication compliance is critical for all aspects of pediatrics, specifically in successful treatment, disease prevention, and health promotion. It is unfortunate that numerous studies and physician accounts reveal difficulties in achieving compliance with pediatric medication. At least one third of all patients fail to complete relatively short-term treatment regimens.^[4] Medication compliance was well reviewed by Jones in 1983, and little has changed since then in terms of medication issues. However, compliance issues are changing because dramatic changes in the financing and organizing of health care already exert a negative effect on medication compliance.

Many pediatricians are surprised to know that not all the medicines prescribed to the patient are taken.^[5] Noncompliance is a major problem throughout the world especially in developing countries where illiteracy, ignorance, poverty and over population are major challenges. Compliance studies in most developing countries have received very little attention and very few data have been published so far.

Author Affiliations: Discipline of Social and Administrative Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia (Dawood OT, Mohamed Ibrahim MI, Palaian S)

Corresponding Author: Omar Thanoon Dawood, Discipline of Social and Administrative Pharmacy, Universiti Sains Malaysia, Penang, Malaysia (Tel: +60174 145676; Email: othd2000@yahoo.com)

doi:10.1007/s12519-010-0218-8

©Children's Hospital, Zhejiang University School of Medicine, China and Springer-Verlag Berlin Heidelberg 2010. All rights reserved.

Definition of compliance

The word "adherence" has been suggested to be used as an alternative to compliance but with the same basic definition. Adherence may be defined as the extent to which the patient's behavior matches or agrees with physician's recommendations. Compliance as it relates to health care is the extent to which a person's behavior coincides with medical or health advice.^[6] Compliance simply means that patient follows the recommendations which are made by healthcare professionals. These recommendations often include taking medications as well as making lifestyle changes such as cessation of smoking, eating right and getting the right kind of physical activity in child daily life. Unfortunately, many children do not recognize the importance of following their doctor's advice in maintaining their health. These definitions add components such as knowledge of medication, timely filling of prescriptions, exact dosage, accurate timing of the doses, approximate sequence of taking the drug, correct length of therapy, and timely attendance for follow-up appointments.^[6]

Consequences of noncompliance among children

Some of the consequences are listed below:

Unnecessary medication: The health concern is that lack of compliance can cause inadequate or unsuccessful therapy and unnecessarily extended treatment, and cause additional doctor visits or changed prescriptions.^[5]

Treatment failure: Delayed recovery may happen when the patients discontinued their therapeutic regimen and this may lead to more suffers from illnesses, more costs and hospitalization. Poor compliance places children at risk for problems such as prolonged disease, complicates the physician-patient relationship, and prevents accurate assessment of the quality of care provided.^[4]

Toxicity: The incidence of toxicity may increase when the patients add additional dose without any instruction from their physicians or other health care providers, and this may lead to increased rate of morbidity and mortality among the patients.

Medications interaction: The interactions between medicines may occur when the patients use medicines improperly and do not follow their physician's instructions.

Reasons/barriers for noncompliance

The demands of daily schedules of living, stress, and typical family conflict are the biggest barriers to medication compliance.^[7] Children not take their medications can be attributable to parents' lack of understanding of the diagnosis, concerns about drug therapy effectiveness, and fear of medication side-effects. This is especially true in children with chronic diseases. Age, socioeconomic status, race, and family factors can also influence compliance to treatment, especially in children with asthma, epilepsy, and diabetes.^[8,9] One survey among parents of children with asthma indicated that parental concerns about controller medication were associated with poor medication compliance. Parents may stop the daily inhaler for the child when their child feels better, thinking that will prevent the adverse reactions of medication.^[10] Compliance is better for short-term treatments and tends to decline over time, which can be especially problematic when managing chronic conditions.^[11] More complicated regimens also lead to decreased compliance, and patients on a single medication are more likely to be compliant than those on multiple medications.^[12] Various parameters influencing medication compliance in chronic illness like age, gender, community, income, parental education and occupation, number of children, number of family members, form of medicine and number of medicines were studied in details. No single factor consistently influenced medication compliance. Negligence and poverty play a very important role in medication compliance.^[11] Health literacy is not only the cause of compliance failure. It is possible that some patients may not afford to buy enough medicine due to poverty but they do not want to disclose the facts of their conditions.^[12,13]

At the level of the individual child, inappropriate expectation about a child's developmental level may be part of a compliance problem and issues of social-emotional functioning, as well as normal developmental issues.^[11] The interaction between the health care provider and the patient is an important factor affecting medication compliance. The lack of communication between health care providers and children or parents lead to noncompliance. Therefore, the health care team should be trained to play an active role in counseling the patients on administration of inhalers, injection and other medication with difficult administration.^[13]

Strategies to improve medication compliance among children

Strategies to improve compliance in children include regular contact between parents and physicians,

information counseling, simplified drug regimens, and self-management plan. Physicians can improve the compliance by providing patient information sheet with names of medicines, schedule, dosage, and common side-effects.^[14] Health care providers should play a major role in this issue and adapt some points when communicating with pediatric patients.

Using simple effective tools

This process is dependent on the family's cultural beliefs, their perceptions of disease severity, and their understanding of the benefits of treatment. Patients often construct their own versions of compliance according to their personal worldviews and social contexts.^[15] Language barriers and low health literacy have been shown to be obstacles to adherence. Translated patient information sheets can be found on the Internet, in local pharmacies, through pharmaceutical companies, and through private translation services.^[1]

Using technology to improve medication compliance

In randomized clinical trials, children and adolescents have been found to improve their self-care after having health education and playing disease management video games.^[16] New technologies are also helping to improve medication compliance. Electronic monitors are available to measure compliance by detecting actions necessary to administer medications, such as removing the cap from a pill bottle. These monitors store downloadable time- and date-stamped information for up to several months and can provide precise information on the frequency and timing of actual dosing and reveal daily patterns of compliance.^[17] The latter ranges from simple calendars and reminders to sophisticated electronic "pill boxes" with the capability to record the time that the medication was removed from the box.

Availability of sources of information

Knowledge obtained from various aspects of compliance can be used advantageously to reduce non-compliance to the prescribed therapy. During the early days of the diagnosis, high levels of stress can lessen the positive effect of educational efforts by interfering with rational thought, a critical component to information processing. Thus, this information needs to be given again at a later date. Various techniques have been used such as a designated "home support person" or a "written contract" defining specific responsibility of each individual in the care of the patient and reinforcement concerning the medication contingent with its administration.^[18]

Patients education

Patients' education regarding disease, medications used, benefits of medication, and potential side-effects of medication can enhance compliance.^[18] Educational efforts and reinforcement must be continuous and should be tailored to meet the needs of the individual patient during various stages of the disease and intervening social and medical changes. Involvement of patients, immediate and extended family with strong social support, encouragement, hopefulness and positive attitudes are important factors in the enhancement of adherence to medical advice and regimens.

Conclusion

Poor compliance to medical regimens may have serious consequences for patients in terms of their health outcomes. It occurs for a variety of reasons, and most cases have multiple causes. Factors affecting compliance may be related to illness and treatment regimen itself, characteristics of individual child such as developmental level and psychopathology, and characteristics of the family system in which the child lives. Poor communication between health care providers and the patients was a factor leading to failure of treatment regimens.

On the other hand, many factors affect medication compliance. They are community, occupation of the father and the education level of the parents. However, the form of medicine, cost and access to medication are also factors noticeable in poor countries. From the literatures on medication compliance, we found that no single factor has been consistently found to influence the compliance. Results have varied substantially among different workers in this field and one cannot give a clear explanation that accounts for all instances of compliance failure. In spite of giving proper instructions to the parents, writing prescription in legible hand writings and confirming that the parents understood the instructions well, there was a significant compliance failure.

Funding: None.

Ethical approval: Not needed.

Competing interest: No benefits in any form have been received or will be received from any commercial party related directly or indirectly to the subject of this article.

Contributors: Dawood OT wrote the first draft of this paper. All authors contributed to the intellectual content and approved the final version. Mohamed Ibrahim MI is the guarantor.

References

- 1 Lask B. Motivating children and adolescents to improve adherence. *J Pediatr* 2003;143:430-433.
- 2 Nevins TE. Non-compliance and its management in teenagers. *Pediatr Transplant* 2002;6:475-479.
- 3 Haynes RB, McDonald H, Garg AX, Montague P. Interventions for helping patients to follow prescriptions for medications. *Cochrane Database Syst Rev* 2002;(2):CD000011.
- 4 Jones JG. Compliance with pediatric therapy. *Clin Pediatr (Phila)* 1983;22:262-265
- 5 Matsui DM. Drug compliance in pediatrics. *Pediatr Clin North Am* 1997;44:1-14.
- 6 Sheldon W, David OL, Adam LH, David T. How do you improve compliance? *Pediatrics* 2005;115:e718-724.
- 7 Penkower L, Dew MA, Ellis D, Sereika SM, Kitutu JM, Shapiro R. Psychological distress and adherence to the medical regimen among adolescent renal transplant recipients. *Am J Transplant* 2003;3:1418-1425.
- 8 Snodgrass SR, Vedanarayanan VV, Parker CC, Parks BR. Pediatric patients with undetectable anticonvulsant blood levels: comparison with compliant patients. *J Child Neurol* 2001;16:164-168.
- 9 McQuaid EL, Kopel SJ, Klein RB, Fritz GK. Medication adherence in pediatric asthma: reasoning, responsibility, and behavior. *J Pediatr Psychol* 2003;28:3233.
- 10 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;5:306-310.
- 11 La Greca AM, Schuman WB. Adherence to prescribed medical regimens. In: Roberts MC, eds. *Handbook of pediatric psychology*. New York: Guilford, 1995: 55-83.
- 12 Johnson SB. Managing insulin dependent diabetes mellitus: a developmental perspective. In: Wallander J, Siegel L, eds. *Adolescent health problems: behavioral perspectives*. New York: Guilford Press, 1995: 265-288.
- 13 Mellins CA, Brackis-Cott E, Dolezal C, Abrams EJ. The role of psychosocial and family factors in adherence to antiretroviral treatment in human immunodeficiency virus-infected children. *Pediatr Infect Dis J* 2004;23:1035-1041.
- 14 Paula Gardiner MD, Lana D. Promoting medication adherence in children. *Am Fam Physician* 2006;74:793-798, 800.
- 15 Sawyer SM, Aroni RA. Sticky issue of adherence. *J Paediatr Child Health* 2003;39:2-5.
- 16 Lieberman DA. Management of chronic pediatric diseases with interactive health games: theory and research findings. *J Ambul Care Manage* 2001;24:26-38.
- 17 Rapoff MA, Belmont JM, Lindsley CB, Olson NY. Electronically monitored adherence to medications by newly diagnosed patients with juvenile rheumatoid arthritis. *Arthritis Rheum* 2005;53:905-910.
- 18 Sidel V, Berger JL, Lisi-Fazio D, Kleinman K, Wenston J, Thomas C, et al. Controlled study of the impact of educational home visits by pharmacists to high risk older patients. *Community Health* 1990;15:163-174.

Received September 7, 2009

Accepted after revision December 23, 2009