

What do children know about medications?

A review of the literature to guide clinical practice

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Abstract

Objective To guide physicians in their communications with children about medications.

Quality of evidence PubMed, EMBASE, and the Cochrane Library were searched from 1980 up to August 2009 for qualitative and quantitative research that investigated children's knowledge of and beliefs about medications (levels of evidence II and III). Findings presented relate to healthy children aged 6 to 12 years old unless stated otherwise.

Main message In order to improve children's use of medicine, experts suggest that physicians communicate directly with children about medications, instead of communicating only with parents or caregivers. Children as young as 6 years old form opinions about medications, and many of these opinions persist in the adult population. This article reviews what we know about how children identify medication; children's fear of medication; how they believe medication works; and their understanding of the medication-related concepts of medication efficacy, side effects, and treatment compliance. This knowledge will help physicians communicate more effectively with children about their medications.

Conclusion Family physicians can help children understand why they take medicine and how to use it appropriately starting at an early age. This early training might affect their medication-taking behaviour throughout their adult lives. Studies in Canada are needed to further understand children's beliefs about medication and to see if these beliefs correlate with international data.

Résumé

Objectif Guider le médecin lorsqu'il discute de médicaments avec les enfants.

Qualité des preuves On a consulté PubMed, EMBASE et la Cochrane Library de 1980 à août 2009 à la recherche d'études qualitatives et quantitatives sur les connaissances et croyances des enfants au sujet des médicaments (niveaux de preuve II et III). Les observations présentées ont été obtenues d'enfants de 6 à 12 ans, à moins d'indication contraire.

Principal message Afin d'améliorer l'utilisation des remèdes par les enfants, les experts suggèrent au médecin d'en parler directement avec les enfants plutôt qu'avec leurs parents ou ceux qui les soignent. Des enfants d'à peine 6 ans se forment une opinion au sujet des médicaments et plusieurs de ces opinions persistent à l'âge adulte. Cet article rappelle ce que nous savons sur la façon dont les enfants voient les médicaments; leur peur des médicaments; ce qu'ils pensent de leur mode d'action; et leur compréhension des concepts associés aux médicaments, comme l'efficacité, les effets indésirables et la fidélité au traitement. Muni de ces connaissances, le médecin pourra discuter plus efficacement avec les enfants de leurs médicaments.

KEY POINTS This article focuses on what is currently known about children's knowledge of and beliefs about medications. Children as young as 6 years old start to form opinions about medications, and these opinions often continue in their adult lives. Family physicians have a role to play in helping children understand why they are taking medication and how to use it appropriately. This early training might affect children's medication-taking behaviour in their adult lives. It is important that family physicians communicate directly with children about their medications, instead of discussing them only with children's caregivers. Communicating with children about medication can avoid misunderstandings and unnecessary fear.

POINTS DE REPÈRE Cet article porte sur ce qu'on connaît actuellement des connaissances et croyances des enfants au sujet des médicaments. Les enfants d'à peine 6 ans ont déjà une opinion au sujet des médicaments, et ces idées persistent souvent à l'âge adulte. Le médecin de famille a un rôle à jouer pour aider les enfants à comprendre les raisons des médicaments et la façon appropriée de les prendre. Une telle formation précoce pourrait affecter leur comportement vis-à-vis les médicaments pour le reste de leur vie. Il importe que le médecin de famille discute directement avec les enfants de leur médication plutôt que de le faire uniquement avec ceux qui les soignent. Discuter de médication avec les enfants peut leur éviter malentendus et craintes inutiles.

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Cet article a fait l'objet d'une révision par des pairs.

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Conclusion Le médecin de famille peut aider les enfants à comprendre la raison des médicaments et la bonne façon de les prendre, et ce, dès leur jeune âge. Une telle formation précoce pourrait modifier leur comportement vis-à-vis les médicaments même lorsqu'ils seront adultes. D'autres études devront être entreprises au Canada pour mieux comprendre les croyances des enfants au sujet des médicaments et pour voir si ces croyances correspondent aux données internationales.

Medications are among the most common therapeutic interventions used to treat or prevent health problems in pediatric patients. In 2008, more than 8.4 million prescriptions made by family physicians were dispensed by retail Canadian pharmacies to children between the ages of 0 and 12 years old.¹ However, researchers have estimated that the average overall medication-compliance rate among the pediatric population is only 50%.² Because the extent to which patients follow treatments influences health outcomes, these data and their implications for outcomes in the pediatric population are raising concerns among family physicians.³ Many authors in the fields of medicine, pharmacy, and nursing,³⁻⁷ as well as governing bodies,^{8,9} suggest that a key strategy to improving medication use in children⁹ is for clinicians to communicate directly with children about medications, instead of communicating only with the parents or caregivers.

In order to provide guidance to family physicians communicating with children about their medications, this article discusses what is currently known about children's knowledge of and beliefs about medications. Specifically, the focus will be on what we know about how children identify medication; their fear of medication; how they believe medication works; and their understanding of the medication-related concepts of medication efficacy, side effects, and treatment compliance. This knowledge will help family physicians to communicate more effectively with children about their medications.

Quality of evidence

This clinical review summarizes the qualitative and quantitative research that investigates children's knowledge of and beliefs about medications (levels of evidence II and III). PubMed, EMBASE, and the Cochrane Library were searched from 1980 up to August 2009 using the following key words: *children, medication knowledge, medicine knowledge, treatment, perceptions, attitudes, medicine-taking, and paediatrics*. A total of 326 articles were identified, and their abstracts were

screened for their timeliness and relevance. Eighteen of these articles matched our research criteria, and their findings, as well as their recommendations, are discussed in this paper. Findings presented relate to healthy children aged 6 to 12 years old unless stated otherwise. These children were exposed to medication at home and by watching television, going to the pharmacy with their parents or caregivers, or being treated for acute illnesses.

Identification of medications

Understanding how children identify medications can help health professionals and parents effectively communicate with children about medications.¹⁰ While children have the ability to distinguish medication from sweets and food at a very young age, they tend to identify it differently depending on their age.⁴ Most children aged 5 years and younger will refer to their medicine by its appearance and identify it by mentioning its colour, shape, and flavour.¹¹

Children aged 6 years and older begin to identify medications more by their brand names and their associated reasons for use. For example, children who have colds might say they took Dimetapp at night because they needed "cough medicine." When 20 kindergarten children were asked about the names of drugs they would take for colds, they named 18 different brand names of medications, in addition to brand names of vitamins and natural products.¹² Children of that age are also clearly aware of brand names like Tylenol and Aspirin.¹¹ Therefore, even at a very young age some children are able to distinguish medications and to provide brand names of medications or indications for use.

Moreover, many children in all age groups can identify medications by their appearance and therapeutic purpose. This is not very different from what is observed in many adults, who also often identify medications by their colours and therapeutic purposes instead of by their real names. This is especially the case with prescribed medications and generic drugs.

Consequently, when educating a young child about medication, emphasis should be placed on the

Levels of evidence

Level I: At least one properly conducted randomized controlled trial, systematic review, or meta-analysis

Level II: Other comparison trials, non-randomized, cohort, case-control, or epidemiologic studies, and preferably more than one study

Level III: Expert opinion or consensus statements

medication's colour or shape in addition to its name, so the child starts to build his or her knowledge of medication and develops multiple ways of identifying the medication. By the age of 10 years, a child's vocabulary regarding health and medication reaches a typical adult level, at which point communication about medications can increase in content and complexity.¹¹

Allowing children to share their understanding of medication by using their own terminology can help health professionals and parents assess what words are easier for children to understand, as well as adjust how they communicate with children about medications either directly or indirectly in the children's presence.

Fear of medication

The negative information or comments children receive about drugs and medications in their homes, such as "keep away" and "they are dangerous," possibly contribute to the development of fear some children have of medications. English-speaking children are very confused about the difference between illicit drugs and prescribed medications. Considerable confusion arises especially around the term *drugs*, which is used to describe both "bad" and "good" drugs.¹³ Although no studies have looked at this topic in Canada, it would be interesting to see if French-speaking children are less confused than their English-speaking peers, as the word *drogues* in French refers almost exclusively to street drugs.

Sometimes children, particularly those younger than 10 years of age, think that medications contain poison and taking poison can lead to death.^{11,14} The focus of health education programs on poison for young children and "bad" drugs for older ones, as well as the lack of formal education about the "good" drugs, might contribute to this phenomenon. Moreover, because their knowledge of medications is limited, children can easily misunderstand or misinterpret conversations that take place between their parents and health professionals. Therefore, questioning children about their beliefs could help dissipate early unnecessary fears about prescribed medications.

Beliefs about how medications work

Most healthy children younger than 8 years old usually have no precise idea of how medications work.^{6,15} They often see the mechanism of medication as magic, especially in injection form. Older children might explain that medications work by "taking the thing away" as they pass through the body, or that medications "make you relaxed" in your bed.¹¹

Children often believe medication is more effective if the pill is bigger, more expensive, and bought at the pharmacy.¹¹ For example, children think that if you take 2 tablets instead of 1, the headache will go away faster.

Interestingly, this misconception is commonly encountered in clinical practice among adult patients as well, and thus children might be mimicking their parents' beliefs.

Although they have only a vague idea of how medications work, children understand that medications are not the only way to cure an illness and that some severe illnesses cannot be cured by medications.¹⁶ They perceive medication as something that helps them to recover just like nonpharmacologic options do, such as rest, special foods or drinks, and the special care they receive when they are sick, which sometimes includes gifts.

Around the age of 8 years old, children start to acknowledge that some medications can be used for the same therapeutic effect (eg, Tylenol and Aspirin can be used for pain). By the age of 10 years, children seem to understand that medications can be dispensed in different forms. This might be explained by the fact that children of this age can now swallow pills and their medications have been switched from syrup to tablets.

Around the age of 10 years, children also start to understand that medications can be used to prevent illnesses. In contrast, younger children seem to not comprehend the preventive effect of a medication and why some children have to take medicines even "if they are not sick."¹⁷ In a cross-cultural study of 8 countries, including the United States, most children were convinced that medications should be taken only when sick.¹⁶ Similarly, another study found that none of the medicines mentioned by 85 school-aged children had preventive effects.¹¹ All the medications were to cure or improve the symptoms of an illness. This gap might be associated with healthy children's limited exposure to preventive treatment.

However, in order to use their medications appropriately, children need to understand how medications will help them and how to take them. Family physicians might need to screen for misunderstanding of the mechanism of action, as this can influence treatment compliance.¹⁸

Concept of side effects

Children acknowledge that medications can have side effects^{6,11,16}; however, only a small number of children reports having experienced side effects with their medications.¹⁶ Older children seem to be more aware of the possibility of side effects, which suggests that they might have greater experience with medication, as well as more exposure to medications in television shows and advertisements.

Most children recognize that it is dangerous and possibly fatal to take the wrong medication, someone else's medication, or a medication for a different illness.^{6,11} These perceptions probably explain why most children seem to not take medications for fun; they know that

taking them without reason can be dangerous and can lead to death.

However, it is hard for young children to comprehend that they can suffer from negative effects of medications at the same time as when the medications are supposed to help them. Even if side effects are mentioned by those as young as 5 years old, children often confuse the cause of the side effects and many attribute these side effects to their illnesses. For example, a child might say that cancer makes your hair fall out, when in reality losing hair is an effect of the anticancer treatment.¹¹ Other children will do the opposite and describe the symptoms of the disease as the side effect of the medication; for example, a child associating cramps caused by gastroenteritis with the antiemetic medication he or she received. Misunderstandings about the side effects of medications and symptoms of illnesses exist among the adult population as well, which suggests that children's understanding of side effects might have an important influence on what they believe as adults.

Box 1^{13,18} offers recommendations to facilitate communication between clinicians and children in clinical practice, based on research investigating children's knowledge of and beliefs about medications.

Box 1. Recommendations for interacting with children and parents about medications

Implement the following recommendations to communicate more effectively with children about their medications:

- Include children in discussions about medications because children form opinions about medications at a young age
- Allow children to share their understanding of medication using their own terminology; this way you can assess which words are easier for them to understand
- Describe the medication, emphasizing its colour or shape, as well as its name, especially if the child is younger than 10 years old
- Use the words *medication* or *medicine* and avoid using the word *drugs* in order to prevent unnecessary fear¹³
- Screen for misunderstanding of the medication's mechanism of action, as this can influence treatment compliance¹⁸
- Discuss both the beneficial and negative effects of treatment to avoid misunderstandings about side effects
- Propose to children and parents more objective methods to keep track of actual medication taking; for example, a calendar in which children can place a mark or a sticker for each dose they take


Children's self-reported treatment compliance

Although younger children will more often mention that they took their medicine because they were told to, most healthy children as young as 5 years old agree that following the given instructions correctly is important in helping them get better.¹¹ Some children will explain, for example, that taking their medications will make them feel better even if they taste bad. Children's concept of medication compliance seems to be influenced by observation of others and their own experiences with medications.

As with adults,¹⁹ findings also suggest that children construct their own subjective views of illnesses and their treatments,^{1,20} which then have implications for adherence to medication regimens. These findings are important to keep in mind when asking a child about compliance to his or her treatment, because a child's personal view of compliance might not necessarily match the clinician's view. Clinicians can then intervene if they suspect, from the actual medication-taking, that the child has a misconception of treatment compliance, preventing full benefit from the treatment.

Conclusion

To improve use of medication in children, many experts now recommend communicating about medications not only with parents and caregivers, but also directly with children. Moreover, many children are forming their own beliefs about medications at a young age and some of these beliefs persist in the adult population. Therefore, family physicians have a role to play in helping children understand why they are taking medication and how to use it appropriately starting at an early age. This early training might affect their medication-taking behaviour throughout adult life.

However, current literature on this topic is based on research conducted in United States and Western Europe. None of these studies was performed in Canada. This presents a substantial limitation because a variety of factors related to Canada's culture, health care system, and regulations of medication advertisements prevent extrapolation of American and European findings to Canadian children. The international literature can nevertheless give us an idea as to what children in general understand and believe about medications. Studies in Canada are needed to further understand the point of view of children and see if the results correlate with international data. 

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Contributors

Miss De Maria completed the literature review and wrote the article. Drs Lussier and Bajcar reviewed and edited the article.

Competing interests

None declared

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