# Parents’ attitudes and views regarding antibiotics in the management of respiratory tract infections in children: a qualitative study of the influence of an information booklet

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**Abstract**

**Background:** Respiratory tract infection (RTI) is the most common reason to consult a general practitioner (GP) during childhood, and often results in unnecessary prescribing of antibiotics. Using an information booklet during the consultation has been shown to be a promising tool to reduce antibiotic prescribing. The influence of such information on parents’ views, knowledge and expectations has not been investigated yet.

**Aim:** We aimed to explore the reported attitude and knowledge of parents towards antibiotics and management of childhood RTI, as well as the added influence parents perceived of an information booklet.

**Design and setting:** Qualitative interviews were conducted with Dutch parents consulting the GP with their child for RTI symptoms and received an information booklet.

**Method:** Semi-structured interviews were audio-recorded, transcribed, coded, and analysed using frame-work analysis by open-axial coding and describing themes.

**Results:** Eighteen parents were interviewed. Four themes were identified: prior reticence towards antibiotics; expectations of the consultation and trust in the GPs’ treatment decision; confirmation and reassurance by the booklet; self-management and future consultation intentions. Dutch parents felt reassured and more confident about their pre-existing reticent attitude towards antibiotic treatment; therefore, they thought their opinion and attitude had not really changed by the booklet.

**Conclusion:** In a low-prescribing country like the Netherlands, information should focus on enhancing self-efficacy and providing concrete safety netting advice. For other countries with less reticence towards antibiotics, we recommend to first study the knowledge, attitude and perceptions of their population to be able to tailor interventions.

**Keywords:** General Practice, Anti-Bacterial Agents, Child, Respiratory Tract Infections

**How this fits in:**

Over-prescription of antibiotics is common in children and information booklets are expected to reduce prescribing, however, their influence on parents’ views and attitude towards antibiotics is unknown. In this qualitative study Dutch parents reported reticence towards antibiotic use for their children with RTI, and felt confirmed in these pre-existing views and more confident to wait and see by the booklet. Parents mainly expected reassurance from their GP, trusted their treatment decision, and appreciated the safety netting advice in the booklet, but the concept of antimicrobial resistance seemed difficult to comprehend. Therefore, information supply should first be piloted against pre-existing views and knowledge in the population.

**Introduction**

Respiratory tract infection (RTI) is the most common reason why children consult a general practitioner (GP).1 RTIs are predominantly viral and self-limiting, therefore, antibiotic treatment is often not recommended.2-5 However, over-prescription of antibiotics has repeatedly been shown.6 Even in a low-prescribing country as the Netherlands about one third of antibiotic prescriptions for children with RTI are not according to the guidelines.7,8 Over-prescription of antibiotics is a worldwide problem. Antibiotic consumption is directly related to bacterial resistance, unnecessary side effects and medicalization, all resulting in higher health care costs.9-11

Previous studies have shown that GPs’ antibiotic prescribing behaviour is influenced by several mechanisms, including uncertain feelings about the clinical outcome, problematic communication, feeling pressured by parents, and fearing that parents will not accept non-prescribing.12-15 RTI consultations are challenging for GPs as they need to make a rational treatment decision, provide reassurance, and offer evidence-based information. Recent reviews showed that the use of patient information booklets during the consultation is a promising tool to reduce antibiotic prescribing and patients’ intention to re-consult.16,17 Use of an interactive booklet about childhood RTI was evaluated in the UK.18 A relevant issue is how such information influences parental perception, knowledge and attitudes, which could also be dependent on contextual factors, like the level of antibiotic use in a country.

We conducted a qualitative interview study with Dutch parents who visited the GP with their child with RTI and received an information booklet within the RAAK trial.19 We explored the reported attitude and knowledge of parents towards (antibiotic) management of childhood RTI, and the influence and added value they perceived of the booklet.

**Methods**

**Setting**  
This qualitative study was performed as part of the RAAK cluster randomised controlled trial, the first Dutch trial aiming to reduce antibiotic prescribing for children with RTIs in primary care.19 The intervention consisted of a concise internet-based training for GPs and we provided GPs with information booklets for parents, without specific instructions how to use it during the consultation. The booklet contained the following information in simple text and pictograms: epidemiology of RTIs, their predominant viral cause, the self-limiting prognosis, rationale to withhold antibiotics, and antibiotic-related problems, including bacterial resistance. Additionally, child-specific self-management strategies and signs and symptoms when to consult the GP were explained. The information booklet is available online as supplementary material.

**Participants**  
Parents of included children from the intervention arm of the trial were consecutively approached by telephone within three weeks after their index consultation and were asked to take part in a telephone interview. All participants provided verbal informed consent. All interviews were transcribed verbatim and anonymized.

**Data collection**   
An interview guide was developed during an expert discussion. The questions were structured into five topics: 1) parents’ attitude and views on antibiotics before having read the information booklet and what might have contributed to these; 2) parents’ general impression of the information booklet; 3) what parents learned from the information booklet and what information they regarded most useful; 4) parents’ perceived changes in attitude and/or views after having read the information booklet and what was considered to have contributed to this change; 5) how the information booklet might affect their expectations of antibiotics and their consultation intentions in the future. Finally, parents were asked whether or not they received an antibiotic prescription for their child. Semi-structured interviews were conducted from March 2015 to May 2015. Data collection and analyses were conducted in parallel and interviews continued until no new themes emerged. Interviews were carried out by researcher TS with Skype 7.5 and audio-recorded with Pamela 4.9, or MP3 Skype recorder 4.11 and were transcribed verbatim.

**Analysis**  
The first four interviews were coded independently by three researchers (TS, AD, EG) and discussed to minimise inconsistencies in coding and to adapt the interview guide when necessary. The coding scheme based on these interviews was discussed with AV, and was adjusted several times until the final coding scheme was unanimously accepted. Framework analysis was used; open-axial coding was applied to relate codes to each other. Related codes were grouped and discussed with all researchers, and, based on consensus, we developed four themes.20,21 Different perspectives on the concepts in our study were sought by analysing the data with a group of researchers from different backgrounds: qualitative research, learning sciences, primary care research and work in general practice.22 Nvivo software version 10.0 was used for analysis.

**Results**

Eighteen parents who received the booklet were interviewed, sixteen mothers and two fathers, with a mean age of 34 years (range 29-38 years). The mean age of their child was three years (range 5 months-6 years). The mean number of siblings was 1.1 (range 0-4). Of these parents, two received an antibiotic prescription for their child during the consultation.

Overall, parents were very enthusiastic about the information booklet. They regarded the booklet as complete, attractive, concise, easy to read and clear. Some stated they would absolutely keep the booklet as a reference, or share it with others.

*[…] Later when I read everything at home I began to think, hey this is useful! I even texted some information to a friend of mine. I quickly took a picture of one of the pages.* (P06)

From the interviews four main themes emerged: (i) Prior reticence towards antibiotics; (ii) Trust in GP and parental expectations of the consultation; (iii) Confirmation and reassurance by the booklet; (iv) Self-management and future consultation intention. These themes will be elaborated upon in further detail.

**Prior reticence towards antibiotics**

Almost all parents mentioned that they were reticent towards antibiotic treatment for their child, also before having read the information booklet. A few thought antibiotics were useful for all infections to make their child recover more quickly. In general, parents believed antibiotics should be avoided for their child if possible.

*I was not just going to administer antibiotics to my son without reason, only if it is really necessary. I was already sure of that, and with that attitude I went to see the GP.* (P06)

Concomitantly, parents also showed a hesitation towards using any medicine, for example, paracetamol. They preferred to consider medication when the body itself seemed unable to fight the illness properly.

*To be honest, I always had this view of using as little medication as possible or even avoiding them at all, unless it is necessary. […] Well, I do believe in the self-healing abilities of the body. So I consider it as administering extra junk when it’s not necessary. If it really helps, I mean, if the body really needs it to get better, or at least get better faster, then it’s fine. But if it’s not really necessary, then I don’t want it.* (P01)

As the reason why parents were reticent towards antibiotics, they explained they thought it has something to do with resistance to antibiotics. Most parents did seem to know something about resistance before having read the information booklet.

*I know you should be cautious* *using antibiotics, and that is of course also because bacteria can form a resistance against it.* (P02)

Half of the parents had understood resistance as a “resistant human body” despite the information explaining development of “resistant bacteria”. They mainly believed that using antibiotics can make the body resistant to any antibiotic. They thought that when they would really need antibiotics, treatment would have limited effect on them. These parents were often also unaware of the fact that antibiotics are ineffective against viral infection and concomitantly, that most of their child’s RTIs are viral.

*I always thought you yourself could become resistant to antibiotics. […] I mean the body itself, because the bacteria are in the body, right? […] So, if you use a lot of antibiotics you will slowly become resistant to them.* (P03)

Sometimes parents considered the resistance of the body as a general problem with medicine, for example, also with painkillers.

*For something simple such as paracetamol, I do not prefer to take all that too much, because, I do not know, maybe your body gets used to it and then they do not have the effect that they could have.* (P13)

A minority knew nothing about bacterial resistance, but also had a clear attitude towards antibiotic use.

*I think they (GPs) prescribe it a little too quickly, maybe waiting to see what happens might be better. […] I don’t really know why I thought this way, I just believe that antibiotics are prescribed too quickly in general. […] I didn’t know anything about resistance before I read the information booklet.* (P12)

Most parents were unaware to point where their initial views and opinions were based on. They mentioned education, their GP, family and friends, and/or the media.

*Well, it is mainly based on information from other mothers, who say uh, well that you shouldn’t use antibiotics on children, if for instance they only have a simple ear, or respiratory tract infection, or an inflammation of the throat. This, because it will resolve naturally most of the time.* (P16)

*Well what you read in the papers, people can become really ill of some kind of resistant hospital bacterium. (P18)*

**Trust in GP and parental expectations of the consultation**

Parents showed a high degree of trust in their GP; when the GP did not prescribe antibiotics they concluded this was not necessary. When antibiotics were prescribed, then this was deemed necessary, or, at least it would be unwise not using antibiotics in this particular situation.

*[…] I have a really good relationship with my GP and the GP knows how I think about antibiotics. The GP will only prescribe if it is really necessary, you know. In that case it wouldn’t work with only good care, without antibiotics.* (P6)

Parents noticed that GPs are nowadays quite reticent to prescribe antibiotics.

*I know that they (GPs) are not very keen on giving antibiotics to children.* (P16)

Parents felt that their GP’s attitude towards antibiotics is in line with their own. Trust made them accept the GPs’ decision whether or not to prescribe antibiotics.

*If the GP prescribes antibiotics, then, I will trust him. I still might ask him for a second time whether it is really necessary or whether we can wait and see for a few more days? Yes, I always ask just to be sure, and my GP always explains it clearly.* (P12)

As a consequence, most parents did not expect an antibiotic prescription, they do, however, expect reassurance and advice about symptoms from their GP when they are in doubt how to manage the child’s illness.

*I did not go to the GP to get antibiotics, I just wanted the GP to listen to his lungs, that kind of examination.* (P4)

The booklet seemed to bring some understanding for those who did not fully understand the choice of the GP to (not) prescribe antibiotics. This was mainly due to the information about the ineffectiveness of antibiotics against viral infection and the disadvantages of antibiotic use.

*I think that the booklet throws some light on it for many people: that it is not unwillingness of my GP, but that the antibiotic really is ineffective for this illness.* (P07)

Most GPs provided the booklet at the end of the consultation and briefly mentioned the content; they advised to read it at home. Parents were satisfied with not discussing the booklet during the consultation because of the clear information.

*… No, I can do without, the booklet was clear enough to read it on my own at home.* (P18)

Only one parent wished the information booklet was explained more by the GP during the consultation; for this parent the booklet contained a lot of new information.

**Confirmation and reassurance by the information booklet**

When asked what new knowledge parents gained from the booklet, half of them said the information was not new, however, useful to read. The information was a confirmation and better explanation of what they already knew or thought. It brushed up their knowledge, reinforced symptomatic management of their children and provided confidence in the self-limiting character of RTIs.

*Actually, it was mostly a confirmation of what I already knew. But it’s always good to read it again.* (P01)

*If someone asks me, why don’t you ask for antibiotics? Yes, then I can say: I don’t do that, because it is not the right solution… I feel more confident, more convinced.* (P15)

Some parents did learn new information from the booklet. They mostly stated to have learned that antibiotics do not work for all infections, only for bacterial and not for viral ones, and/or when to call the GP with alarming symptoms. Other new insights were particularly the disadvantages of antibiotic use, such as resistance and side effects. To a lesser extend information about symptom duration, fever, and self-management advice were considered new.

*Yes, it provided some (new information); […] all those viruses that go round now, for which it is useless to give antibiotics, and that is what I did not know.* (P14)

Most of the parents did not feel their opinion about antibiotics, or knowledge of RTIs had changed by the booklet. They already were quite reticent and this view was confirmed by the information of the booklet. However, they felt they could better explain their opinion.

*The booklet confirmed that I indeed have to be careful with antibiotics. But, that is what I already knew before. I just did not exactly know why. Now, I really understand why.* (P6)

Despite the fact that parents often said that the booklet was easy to read and contained clear pictograms, it, nevertheless, appeared that the information was often explained differently by them. Viruses and bacteria were often mixed up in their explanation why antibiotics do not work; they, for example, said antibiotics only work for specific viruses. As earlier mentioned, the concept of bacterial resistance was often still not fully understood after reading the booklet.

*Well the information that antibiotics have advantages and disadvantages was most useful to me….. The advantage is that antibiotics, mmm, kill those viruses that make you ill, but, that those viruses can adapt themselves, which you actually need for your own resistance I think. (P06)*

**Self-management and future consultation intention**

The information about “when to contact your GP” was regarded as most useful. Some parents therefore thought that the booklet would change their consultation behaviour. Some parents did not think the booklet would have that effect, as they were already reticent in consulting their GP.

*Especially the last page, about when you should call the GP, was the most important for me. I mean, knowing when something is considered minor, and when it is actually necessary to call the GP.* (P13)

*Well, it did change something. I will probably not call the GP as quickly as before, because of the guidance when to call the GP from the booklet. Of course, I take these things into consideration, I mean, does my child have a fever, or not, is the fever persisting for three days now. I’ve always considered these things, but now I know that when my child starts coughing, I will wait a week and see how it turns out.* (P16)

Although parents were quite reticent towards antibiotics and consulting the GP soon upon initiation of symptoms, most parents do acknowledge that once symptoms are persisting they start to worry. Such a consultation is not necessarily for antibiotics, but for reassurance that the illness is not severe, or for self-management options for symptom relieve.

*Well, the problem was that he wasn’t getting enough sleep and was also keeping us awake all night. So, consulting the GP is a way of seeking a solution, but it depends on the symptoms. […] No, no, I didn’t consult to get antibiotics. I just wanted to know if it was just a common cold, or something with his ears, and whether there was something I could do about it.* (P17)

**Discussion**

**Summary**

The information booklet confirmed parents’ pre-existing views towards antibiotics. Therefore, parents reported that it did not really change their attitude, but it did make them feel more confident to wait-and-see first. They valued that the booklet substantiated their prior reticence towards antibiotics, and provided a better understanding of the GPs’ treatment decision. Most parents trusted the GPs’ professionalism and valued their judgement about the severity and treatment of the illness, and they expected reassurance during the consultation. For some parents the information that antibiotics are not effective for most RTIs and the concept of bacterial resistance were new, neither they expected this to change their attitude towards antibiotics. The antibiotic-related information, especially about bacterial resistance seemed difficult to understand. Information about when to consult the GP was regarded as most relevant.

**Strengths and limitations**

A previous qualitative study performed in the UK explored parents’ and clinicians’ views on the development, process evaluation and implementation of an interactive information booklet for parents.18,23 Our study focused on gaining insight into parental reporting on how and why the information booklet influenced their views and attitudes. This information might be relevant to understand the intervention effect, to know which elements were most relevant and to further optimise the intervention. A limitation was that we did not really obtain parents’ views and attitudes before they had read the information booklet; after having read the booklet this might have been difficult to recall and explain. Besides, parents could interpret, favour and recall information from the booklet in a way that confirmed their pre-existing beliefs. Second, the parents visited GPs who had followed an online training in prudent antibiotic prescribing for RTIs and communication skills, which could have influenced the consultation and thereby the parents’ views. Finally, parents knew about the aim of the trial, and could have provided socially acceptable answers.

**Comparison with existing literature**

It has been described that GPs could interpret parental concerns as an implicit demand for antibiotics, which is expected to contribute to over-prescription of antibiotics.7,14,24 In our study parents reported their prior reticence towards antibiotics and high trust in the GP, which resulted in a limited influence of the information booklet on their views. This finding should be envisaged in the Dutch context, with a sober attitude concerning illness and treatment, which might explain the low antibiotic use in comparison with other countries.25 Furthermore, the high continuity of care in Dutch primary care, where patients are registered at one practice and often linked to one GP, is probably the basis for trust in the GP’s non-prescribing decision. These elements are considered to be of high importance in promoting appropriate antibiotic use.26

This antibiotic reticent attitude could, apart from culture, also be caused by misunderstanding of the concept “resistance”. The idea that the less often children take medicine, the better they work was described earlier in a study about the opinions of parents about analgesics for their children.27 Most parents were aware of ‘antimicrobial resistance’ before having read the information booklet, however, it appeared that most parents did not fully understood the concept, despite our efforts to explain this clearly in the booklet. Brookes-Howell *et al.* already described that people in Europe are aware of the link between antibiotic use and resistance, with the misinterpretation of antibiotic resistance as a property of a 'resistant human body' rather than a property of bacteria. They suggested interventions, emphasising the transferability of resistance, and the societal contribution individuals can make through more appropriate antibiotic use to limit bacterial resistance.28 According to our study it seemed difficult for parents to exactly understand what antimicrobial resistance entails and therefore completely understanding the concept appeared not important in a prudent attitude towards antibiotics. Our study showed that the general knowledge that antibiotics have disadvantages, side-effects and cause ‘resistance’, was enough to result in a reticent attititude.

The parents mentioned that the booklet was often not discussed during the consultation but did not regard this interactive use necessary. In the study of Francis *et al*. the interactive use of their booklet did not appear to be consistently implemented as well, but was regarded as important, contrary to our findings.18 Not discussing the booklet during the consultation might save time, and allows the booklet to be distributed already in the waiting room, or via internet. However, in situations without continuity of care, for example out-of-hours care were patients tend to ask for antibiotics more easily, it might be preferred to use the booklet interactively during the consultation.16,26

**Implications for practice and research**

Educating parents specifically on the effectiveness of antibiotics and antimicrobial resistance seemed less relevant than trust in the GP, reassurance and clear safety netting. In countries with a comparable context of low antibiotic use, focus of information supply should be on enhancing self-efficacy and providing safety netting advice. For other countries we recommend to study their population’s pre-existing knowledge, attitude and perception towards antibiotic management for RTI to tailor information supply. In countries, where a reticence attitude might be less ingrained, information booklet could for example support to make patients understand their GP’s non-prescribing treatment decision.

**Additional information**

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**Ethical approval**

Ethical approval: The study was exempted by the University Medical Center Utrecht ethics committee from obtaining parents’ consent and full protocol delivery (no: METC 15-107/C).

**Competing interest**

The authors have declared no competing interests.

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**References**

1. van der Linden MW, van Suijlekom-Smit LWA, Schellevis FG, van der Wouden JC. *Tweede Nationale Studie naar ziekten en verrichtingen in de huisartspraktijk. Het kind in de huisartspraktijk.* Utrecht: Nivel, 2005.

2. Venekamp RP, De Sutter A, Sachs A, et al. [The practice guideline Acute rhinosinusitis from the Dutch College of General Practitioners]. *Huisarts Wet* 2014; **57(10):** 537.

3. Verheij ThJM, Hopstaken RM, Prins JM, et al. The practice guideline "Acute cough" from the Dutch College of General Practitioners]. *Huisarts Wet* 2011; **54(2):** 68-92.

4. Damoiseaux RAMJ, Venekamp RP, Eekhof JAH, et al. The practice guideline "Acute otitis media" from the Dutch College of General Practitioners. *Huisarts Wet* 2014; **57(12):** 648.

5. Dagnelie CF, De Jongh E, Lemmen WH, et al. The practice guideline "Acute sore throat" from the Dutch College of General Practitioners. *Huisarts Wet* 2015; **58(8):** 422-9.

6. Holstiege J, Schink T, Molokhia M, et al. Systemic antibiotic prescribing to paediatric outpatients in 5 European countries: A population-based cohort study. *BMC Pediatr* 2014; **14:** 174-2431-14-174. doi: 10.1186/1471-2431-14-174

7. Dekker ARJ, Verheij ThJM, van der Velden AW. Inappropriate antibiotic prescription for respiratory tract indications: Most prominent in adult patients. *Fam Pract* 2015; **32(4):** 401-407. doi: 10.1093/fampra/cmv019

8. Goossens H, Ferech M, Vander Stichele R, Elseviers M, ESAC Project Group. Outpatient antibiotic use in europe and association with resistance: A cross-national database study. *Lancet* 2005; **365(9459):** 579-587. doi: S0140-6736(05)17907-0

9. Smith R, Coast J. The true cost of antimicrobial resistance. *BMJ* 2013; **346:** f1493. doi: 10.1136/bmj.f1493

10. Costelloe C, Metcalfe C, Lovering A, *et al*. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: Systematic review and meta-analysis. *BMJ*. 2010;340:c2096. doi: 10.1136/bmj.c2096

11. Bell BG, Schellevis F, Stobberingh E, et al. A systematic review and meta-analysis of the effects of antibiotic consumption on antibiotic resistance. *BMC Infect Dis* 2014; **14:** 13-2334-14-13. doi: 10.1186/1471-2334-14-13

12. Macfarlane J, Holmes W, Macfarlane R, *et al*. Influence of patients' expectations on antibiotic management of acute lower respiratory tract illness in general practice: Questionnaire study. *BMJ* 1997; **315(7117):** 1211-1214.

13. Lucas PJ, Cabral C, Hay AD, *et al*. A systematic review of parent and clinician views and perceptions that influence prescribing decisions in relation to acute childhood infections in primary care. *Scand J Prim Health Care* 2015; **33(1):** 11-20. doi: 10.3109/02813432.2015.1001942

14. Cabral C, Horwood J, Hay AD, *et al*. How communication affects prescription decisions in consultations for acute illness in children: A systematic review and meta-ethnography. *BMC Fam Pract* 2014; **15:**63-2296-15-63. doi: 10.1186/1471-2296-15-63

15. Cabral C, Lucas PJ, Ingram J, *et al*. "It's safer to ..." parent consulting and clinician antibiotic prescribing decisions for children with respiratory tract infections: An analysis across four qualitative studies. *Soc Sci Med*. 2015;136-137:156-164. doi: 10.1016/j.socscimed.2015.05.027

16. de Bont EG, Alink M, Falkenberg FC, *et al*. Patient information leaflets to reduce antibiotic use and reconsultation rates in general practice: A systematic review. *BMJ Open* 2015; **5(6)**:e007612-2015-007612. doi: 10.1136/bmjopen-2015-007612 [doi].

17. O'Sullivan JW, Harvey RT, Glasziou PP, *et al.* Written information for patients (or parents of child patients) to reduce the use of antibiotics for acute upper respiratory tract infections in primary care. *Cochrane Database Syst Rev* 2016; **11:** CD011360. doi: 10.1002/14651858.CD011360.pub2

18. Francis NA, Phillips R, Wood F, *et al*. Parents' and clinicians' views of an interactive booklet about respiratory tract infections in children: A qualitative process evaluation of the EQUIP randomised controlled trial. *BMC Fam Pract* 2013; **14:** 182-2296-14-182. doi: 10.1186/1471-2296-14-182

19. Dekker ARJ, Verheij TJM, Broekhuizen BDL et al. Effectiveness of general practitioner online training and an information booklet for parents on antibiotic prescribing for children with respiratory tract infection in primary care: A cluster randomised controlled trial. *J Antimicrob Chemother.* Forthcoming 2017.

20. Pope C, Ziebland S, Mays N. Analysing qualitative data. *BMJ* 2000; **320(7227):** 114-116.

21. Gale NK, Heath G, Cameron E, *et al*. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 2013; **13:** 117-2288-13-117. doi: 10.1186/1471-2288-13-117

22. Richards H, Emslie C. The 'doctor' or the 'girl from the university'? Considering the influence of professional roles on qualitative interviewing. *Fam Pract* 2000; **17(1):** 71-75.

23. Francis N, Wood F, Simpson S, *et al*. Developing an 'interactive' booklet on respiratory tract infections in children for use in primary care consultations. *Patient Educ Couns* 2008; **73(2):** 286-293. doi: 10.1016/j.pec.2008.07.020

24. T. Stivers. *Prescribing under pressure: Parent-Physician Conversations and Antibiotics.* New York: Oxford University Press, 2007.

25. Goossens H, Ferech M, Coenen S, *et al.* European Surveillance of Antimicrobial Consumption Project Group. Comparison of outpatient systemic antibacterial use in 2004 in the united states and 27 european countries. *Clin Infect Dis* 2007; **44(8):** 1091-1095. doi: CID41134 [pii].

26. Brookes-Howell L, Wood F, Verheij T, et al. Trust, openness and continuity of care influence acceptance of antibiotics for children with respiratory tract infections: A four country qualitative study. *Fam Pract* 2014; **31(1):** 102-110.

27. Rony RY, Fortier MA, Chorney JM, et al. Parental postoperative pain management: Attitudes, assessment, and management. *Pediatrics* 2010; **125(6):** e1372-8. doi: 10.1542/peds.2009-2632 [doi].

28. Brookes-Howell L, Elwyn G, Hood K, et al. 'The body gets used to them': Patients' interpretations of antibiotic resistance and the implications for containment strategies. *J Gen Intern Med* 2012; **27(7):** 766-772.