

ORIGINAL RESEARCH

Challenges to nurse prescribers of a no-antibiotic prescribing strategy for managing self-limiting respiratory tract infections

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Abstract

Aims. To report a qualitative study of the experiences of nurse prescribers in managing patients with self-limiting respiratory tract infections.

Background. Patients frequently attend primary care with respiratory tract infections. Although a no-prescribing strategy is recommended for these consultations, general practitioners frequently prescribe antibiotics, citing non-clinical reasons such as patient pressure. Nurses increasingly manage people with respiratory tract infections, but research has not yet explored their experiences within such consultations.

Design. Semi-structured interviews and focus groups.

Methods. Fifteen semi-structured interviews and three focus groups ($n = 5$, $n = 4$, and $n = 12$) with a purposive sample of nurse prescribers ($n = 34$) and other non-medical prescribers ($n = 2$) were conducted between November 2009–November 2010. A qualitative approach was used to develop conceptual categories from the dataset, and emerging themes were explored in subsequent interviews/focus groups.

Findings. Although participants reported experiencing numerous challenges within these consultations, they believed that they possessed some of the communication skills to deal effectively with patients without prescribing antibiotics. Participants reported that protocols supported their decision-making and welcomed the benefits of peer support in dealing with ‘demanding’ patients. However, the newness of nurses and other non-medical prescribers to the prescribing role meant that some were cautious in dealing with patients with respiratory tract infections.

Conclusion. Training for nurses and other non-medical prescribers should focus on building their confidence and skills to manage people with respiratory tract infections without recourse to antibiotics. Further work should seek to explore which strategies are most effective in managing respiratory tract infections while maintaining patient satisfaction with care.

Keywords: antibiotics, non-medical prescribers, nurse prescribers, nurses, respiratory tract infections

Introduction

Inappropriate antibiotic prescribing for self-limiting respiratory tract infections (RTIs) increases healthcare system costs, antimicrobial resistance, and iatrogenesis (harm caused by treatment) (e.g. World Health Organisation 2001, Little *et al.* 2005, NICE 2008, European Centre for Disease Prevention and Control 2009). While research has explored reasons for inappropriate antibiotic prescribing for RTIs by general practitioners (GPs) (e.g. Butler *et al.* 1998, Hare *et al.* 2006), little attention has been given to the experiences of nurses. Nurses and other allied health professionals (such as pharmacists) are permitted to prescribe medications in a number of countries including the UK, USA, Sweden, Australia, and New Zealand (Wilhelmsson & Foldevi 2003, Moller & Begg 2005, CHSRP & Walton 2006, Miles *et al.* 2006, McMillan & Bellchambers 2007). If attempts to reduce antibiotic prescribing for patients with RTIs in primary care are to be successful, it is important to explore prescribing practices of all health professionals involved in managing these conditions.

Background

Respiratory tract infections, including coughs, colds and sore throats, are the most frequent acute problems for which patients consult within primary care, with around 25% of the population presenting with an RTI annually (McCormick *et al.* 1995, Fleming *et al.* 2003, Ashworth *et al.* 2004, Ashworth 2005, NICE 2008). Most RTIs are viral and self-limiting, and can be managed effectively with paracetamol, fluids, and rest (NICE 2008, <http://www.patient.co.uk> 2009); antibiotics are unnecessary and ineffective for these conditions (Little 1997, Altiner *et al.* 2007, Cosby *et al.* 2007, NICE 2008). Despite this, 45–91% of RTI consultations result in an antibiotic prescription (Ashworth *et al.* 2004, Ashworth 2006, Petersen & Hayward 2007), and up to 80% of antibiotics are prescribed inappropriately (Scott *et al.* 2001).

Over-prescribing of antibiotics represents a significant concern in terms of individual and population level resistance (Arason *et al.* 1996, World Health Organisation 2001, Goossens *et al.* 2005, Cars *et al.* 2008, European Centre for Disease Prevention and Control 2009, Costelloe *et al.* 2010), and has financial implications for health services (Little & Williamson 1996, Butler *et al.* 1998, Gonzales *et al.* 2001, Little *et al.* 2005, NICE 2008). One in 16 people experience adverse side-effects of antibiotics (e.g. vomiting, rash, diarrhoea) (Butler *et al.* 1998, Arroll & Kenealy 2006). Furthermore, unnecessary prescribing 'medicalises' self-limiting

conditions, reducing the likelihood that patients will self-manage, perpetuating beliefs about the effectiveness of antibiotics and increasing intentions to reconsult (Little 1997, Little *et al.* 1997, Williamson *et al.* 2006, NICE 2008).

Research to date has tended to focus on trying to understand why GPs prescribe antibiotics for RTIs (Butler *et al.* 1998, Scott *et al.* 2001, Kumar 2003, Little *et al.* 2004, Petursson 2005). However, GPs are not the only health professionals involved in treating and managing RTIs. For example, since 2001, nurses and allied health professionals in the UK are able to prescribe from a limited range of medications supervised by an independent prescriber and since 2006 have been permitted to prescribe licensed medication independently for any medical condition within a set of clinical competencies (Department of Health, 2006). By October 2009, there were over 14,000 independent non-medical prescribers (NMPs) in England (NHS National Prescribing Centre 2010), many working within primary care settings and responsible for managing patients with a wide range of conditions, including RTIs (Reeves 2007).

US national survey data indicate that nurse prescribers (NPs) prescribe antibiotics when they are not clinically warranted at a similar rate to doctors (Ladd 2005). Although Ladd (2005) examined numerous factors associated with inappropriate prescribing, the experiences and perceptions of the prescribers themselves remained unexplored. Furthermore, due to cultural differences in antibiotic use, the results of Ladd's (2005) study may not be generalizable to the UK (McKee *et al.* 1999, Cars *et al.* 2001, Goossens *et al.* 2005). A UK-based questionnaire study found that NPs were less likely than GPs to report patient expectations for antibiotics or to be influenced by these when making prescribing decisions (Weiss 2004). Possibly, NPs experience RTI consultations differently from GPs, and thus attempts to address antibiotic prescribing should be tailored to meet NPs' specific needs. However, Weiss's (2004) study was conducted prior to the introduction of the independent NMP role, and focused on prescribing under Patient Group Directions, a more-restricted method of prescribing than that used by many NPs today, and clearly different from the less-restricted prescribing practices of GPs. As such, the finding that NPs were less likely to report patient pressure or prescribe antibiotics may be due to these restrictions; the absence of these restrictions for independent prescribers may mean that consultations are experienced differently with different implications for prescribing behaviour. Thus, to address inappropriate antibiotic prescribing for RTIs within modern primary care, it is necessary to understand the specific challenges NPs and other NMPs face so that their training and support can be tailored appropriately.

The study

Aims

To explore how NPs and other NMPs experience RTI consultations, and the challenges they face in trying to implement a no-prescribing strategy.

Design

Semi-structured interviews and focus groups were conducted to allow in-depth exploration of NPs and NMPs' experiences managing patients with RTIs.

Participants

Sampling took place as part of a wider research programme examining the views and experiences of different prescribers (NPs, NMPs, GPs and GP trainees) around RTI management (Peters *et al.* 2011). Purposive sampling was used to select participants based on practice location, discipline, age, and care setting (scheduled vs. unscheduled) to ensure that a full range of views were represented (Peters 2010). Participants were recruited through direct contact with practices and advertising at local training events.

Data collection

Interviews

Participants were interviewed (by AC or SM) between November 2009–May 2010. Fourteen participants were interviewed face-to-face in their own practice or in a university meeting room. One was interviewed over the telephone. Participants were asked to talk about their experiences with RTIs and how they manage these consultations. Although a topic guide was used, interviewers were responsive to issues emerging from participants' accounts. Mean interview length was 35 minutes (Range = 13–82 minutes).

Focus groups

Three focus groups (led by SP and facilitated by AC) were conducted ($n = 5$, $n = 4$, and $n = 12$) between June 2010–November 2010; two were conducted at participants' place of work (walk-in centre) and one at a continuing professional development event for NPs and NMPs. Mean focus group length was 86 minutes (Range = 82–87 minutes).

Ethical considerations

NHS ethical approval was obtained through the local NHS Research Ethics Committee (ref 09/H1005/73). All

participants gave written informed consent prior to participation and were free to withdraw at any time. Interviews and focus groups were digitally audio-recorded and transcribed verbatim with any identifying information (e.g. names and practice locations) removed. Audio files and transcripts were stored in a secure location, separate from participant records.

Data analysis

Conceptual categories were developed through the identification of recurrent patterns and associated codes that were placed into an analysis document. Categories were organized into themes by identifying categories that grouped together along common dimensions. This document was refined and elaborated in light of incoming data and discussion between members of the research group, which included researchers and clinicians with expertise in health psychology and primary care. Analysis was performed in parallel with sampling and data collection, and an iterative process was used in which emerging themes were explored throughout the data collection process and attended to and developed in further interviews and focus groups. This process of constant comparison between the interview data and analysis allowed categories to be developed until interview data no longer added new information and thematic saturation was reached (Strauss & Corbin 1998).

Rigour

All interviews were analysed by SR and at least one other author (AC, SP, AW or CCG) and emerging themes were discussed to check for reliability and trustworthiness of analysis. Where disagreements arose, discussions continued until consensus was reached. Verbatim transcriptions of audio-taped data were used to preserve the accuracy of the original data and an ongoing record of analysis was kept to monitor the analysis process. The dual method of data collection (interviews and focus groups) with a range of prescribers allowed for data triangulation.

Results

Participants

The sample consisted of 31 NPs and 2 NMPs (one pharmacist and one physiotherapist, both of whom participated in focus groups) from a variety of scheduled and unscheduled care settings. Participants were aged between 21–59 years (Mean = 41.72, SD 8.24), and 30 (91%) were female. Twelve participants (all NPs) took part in interviews, 21 took part in focus groups (2 NMPs and 19 NPs) and three

NPs took part in both. See Table 1 for detailed demographic data.

Three main themes were identified relating to experiences of self-limiting RTI consultations. These are summarized in Figure 1 and described in turn below. Quotes are attributed to individual interviews or focus groups using identifiers (e.g. NP1, Focus Group 1). All quotes from individuals are from NPs.

Reasons patients present with RTIs

RTI consultations comprised a large proportion of NPs' caseloads, with most seeing RTI patients on a daily basis. Common RTI presentations were coughs and colds with most judged to be viral and not requiring antibiotics. Prescribers felt that some patients may present too early with RTIs:

They had come in with a cough and 'oh it's a terrible you know I can't go to work', they sounded really poorly and I asked them how long it had been going on for and it was 2 hours. (NP12)

A key reason patients were thought to consult was for reassurance that their illness was not serious:

Their initial concerns is that they have got a chest infection, or there is something more underlying than a normal virus...most of the patients thinking it's more serious. (NP11)

Table 1 Sample characteristics for interviews ($n = 15$) and focus groups ($n = 21$).

Characteristic	Interviews	Focus groups
Care setting		
Scheduled (e.g. GP surgeries)	4	6
Unscheduled (e.g. out-of-hours and walk-in)	7	9
Both scheduled and unscheduled	2	1
Other (community/chronic illness services)	2	5
Role		
Nurse prescriber (NP)	15	19
Pharmacist prescriber	0	1
Physiotherapist prescriber Nu	0	1
Gender		
Male	1	2
Female	14	19
Age (years)		
Mean	45.93	45.15
sd	6.73	9.58
Range	32–59	21–59
Nationality		
British	14	21
Irish	1	0

Participants described patients' desire for treatment as an important determinant of whether patients would present with RTIs and believed many wanted a 'quick fix'. NPs perceived that patients believed antibiotics were the appropriate treatment. These expectations were attributed to a lack of knowledge about self-management techniques, likely causes of symptoms, and how antibiotics work. In particular, NPs highlighted patients' lack of understanding about the difference between viral and bacterial illnesses and the (in) effectiveness of antibiotics for treating RTIs. Participants suggested that previous experiences of receiving antibiotics for RTIs (from themselves or another prescriber) had reinforced these faulty beliefs:

Patients will say like, well that antibiotic you gave me last year, it was better in an hour. (NP2)

Challenges faced by NPs when dealing with patients with RTIs

Participants reported two types of challenges during RTI consultations, those relating to the nature of RTI consultations, and those associated with the NP role.

Challenges within the RTI consultation

Participants reported that RTI consultations could be time-consuming and complex, needing to balance dealing with patients' concerns and expectations with providing education and advice about the cause of RTIs and how to self-manage the illness. However, many NPs did not consider limited time a barrier to effectively managing the consultation:

I mean you can usually do, you can usually manage to examine somebody and explain within kind of 10/15 minutes...it doesn't take that long. (NP7)

Another challenge was the difficulty in diagnosing RTIs due to overlap in symptom presentation for viral and bacterial infections. NPs were cautious when presentations involved diagnostic ambiguity, and some wanted more training in this area. A major concern for NPs was the possibility of missing something important in the consultation, particularly for children or those with co-morbidities:

If patients are compromised immunologically, so they have got sort of an underlying immune disorder then I would probably error (sic) on the side of caution. Even if I wasn't necessarily totally convinced, I would be worried not to treat. (NP5)

Challenges associated with NP role

NPs were aware they did not have the level of training and experience of GPs and were concerned about the possibility of making mistakes or faulty decisions. Linked to this was

Experiences of RTI consultations		
<p>Reasons patients present with RTIs</p> <ul style="list-style-type: none"> • Emotional reasons <i>Anxiety, seeking reassurance</i> • Treatment for symptoms <i>Quick fix, pain relief</i> • Antibiotic expectations <i>Previous experience, lack of education</i> 	<p>Challenges for Nurse Prescribers</p> <ul style="list-style-type: none"> • Challenges within the consultation <i>Patient expectations, diagnostic uncertainty, time consuming</i> • Challenges of the NMP role <i>Close scrutiny, lack of authority/autonomy, lack of continuity of care</i> 	<p>Strategies for managing RTI consultations</p> <ul style="list-style-type: none"> • Reinforcing no-prescribing decision <i>Support networks, clinical guidelines, leaflets</i> • Education <i>Self-management, RTI timeline, how ABs work, negative consequences of ABs</i> • Managing patient concerns <i>Reassurance, empathy, clear explanation, clinical exam</i>

Figure 1 Main themes and sub-themes relating to NPs’ experiences of RTI consultations.

the perception that due to the newness of the NP role, they were particularly open to criticism and scrutiny of their ways of working. NPs also considered that they had to have solid justifications for prescribing decisions and that there was a lack of legal protection for NPs. However, this did mean that NPs were thorough and cautious when dealing with RTIs:

An awful lot of nurses are quite cautious prescribers. And they would check things out really before they kind of prescribe because they are scared to do wrong you know...I think legally GPs are probably more established so they have got, they have probably got more protection than the nurses have currently. (NP3)

In addition, some NPs felt that patients perceived them as lacking in expertise and authority compared with GPs:

Sometimes I bring the doctor in...because sometimes they would listen to them, more than me, but I used to bring the doctor in who I knew wouldn’t give antibiotics. (NP10)

However, while some NPs indicated that they worked closely with GPs in dealing with patients with RTIs, others reported difficulties such as GPs prescribing antibiotics to patients following a no-prescribing decision from an NP. This was a source of frustration for NPs as they felt it undermined their expertise and attempts to educate patients. Overall, NPs felt that there needed to be better communication and closer working between GPs and NPs:

I sent tonsillitis viral and they wanted antibiotics and they’d gone through everything and my last thing was, you can always see someone else if you’re not happy and that’s what they wanted and he [GP] went and he give it, some antibiotics. I were fuming... I called him and asked him, why did you give it? And he held his hands up, he said you’re right you’re right in everything you’ve said but just

wouldn’t have the guts to say no at the end of it, I said well why bother. (Focus Group 1)

Strategies for managing RTI consultations

Although a minority of NPs reported having prescribed antibiotics inappropriately in the past due to time pressure, patient expectation and/or clinical uncertainty, most indicated that they would not prescribe antibiotics unless warranted by the clinical diagnosis (i.e. a bacterial rather than a viral infection) and would not prescribe in response to patient pressure:

If we think it’s viral we won’t be giving it full stop...if we think something’s viral no matter how much they kick up a fuss we won’t give it. (Focus Group 2)

Instead, NPs described a range of strategies that enabled them to manage patients with RTIs without prescribing antibiotics. These included education, reinforcing the no-prescribing decision, and managing patients’ concerns.

Patient education

In line with the perception that antibiotic expectations arose at least partly due to erroneous beliefs about RTIs and antibiotics, participants employed strategies oriented towards educating patients. Some achieved this by explaining the differences between viral and bacterial infections and attempting to modify patient beliefs about antibiotics and the timeline of viral infections. Others focused on the negative consequences of over-prescription of antibiotics in terms of adverse side-effects and resistance:

I normally say to them well the reason it got better is because these things normally last about 6 days and if you think you have had

symptoms for maybe 2/3 days by the time you get to see your doctor it's another 2 or 3 days, by the time you start getting your antibiotics, in your system it's another 2 or 3 days, that is 9 days, so probably yes you are going to start feeling better... regardless of whether you had the antibiotics or not, so just try not taking them for once and just see what happens. (NP10)

Participants viewed education about self-management as central to their role and advised patients on various forms of symptom relief for RTIs, including drinking fluids (hot and cold), keeping warm, steam inhalation, taking paracetamol, and using cough linctuses, although some NPs expressed concerns over not always being sure which approaches were evidence-based. Educating patients about self-management was seen as an opportunity to reduce the likelihood of patients consulting with similar illnesses in future:

It's a wasted opportunity I think if a patient comes, and you just don't educate them properly, because then in future you are just making more work for yourself I think, they are more likely to come back. (NP10)

Participants were clear that it was important to involve patients in discussions about treatment decisions and to give explanations so that patients understand why specific decisions have been made. Participants also used aids such as drawings and information leaflets to clarify these explanations.

Reinforcing the no-prescribing decision

Participants referred repeatedly to guidelines and protocols they were required to follow when making prescribing decisions. Although these were occasionally seen as restrictive in that they necessitated explicit justification for prescribing, most saw them as helpful in justifying a no-prescribing decision to patients:

We have to document what we see...we can't give it if there's no indication, we tell this to patients all the time, if they don't like it, there's nothing we can do. (Focus Group 2)

Participants also highlighted the value of peer support in dealing with the challenges of RTI consultations and reported that it was sometimes helpful to ask another NP (or GP) to reinforce the diagnosis and decision not to prescribe, or to provide a second opinion where there was diagnostic uncertainty. If a patient remained unhappy with the decision, they would be advised to go to their GP or someone else within the primary care service:

If I have got somebody that I feel really, really won't go, without it [antibiotic prescription] then I get a colleague in and say will you listen to their chest and then we will reinforce it, so we work together here you see so that is why it works so well. (NP6)

Addressing patient concerns

In line with the perception that many RTI patients present concerns about the cause of their symptoms, participants described a number of strategies for managing these. For example, using the findings of the clinical examination to explain to the patient that their illness does not require antibiotics, reassuring patients that they are doing the correct things in terms of managing their symptoms, describing signs to be aware of which might indicate a more serious illness, and encouraging reconsulting if symptoms change:

I will listen to their chest, and you know just so they think they have had a thorough examination really because half the time it's just they feel that people aren't listening to them, or they are not taking them seriously...I am quite happy that they are well most of the time, so I just do it to sort of make them feel reassured, because a lot of it is just anxiety of people. (NP10)

Participants indicated that in telling patients they did not have a bacterial infection and communicating the no-prescribing decision, it was important not to imply that a viral infection was less severe thereby dismissing the patient's illness. Thus, illness validation and empathy were viewed as particularly important when antibiotics were not prescribed:

I like to let them know how bad a virus actually is...let them know that you know I believe that you are unwell I'm not poohpohing your unwellness it's just unfortunately my piece of paper isn't going to give you a cure, it's viral...I think often they think they've been fobbed off by it's just a virus. (Focus Group 3)

Overall, participants reported that the majority of patients could be satisfied with a no-prescribing decision, even when their original expectation had been for antibiotics. This was attributed to the fact that patients understood 'why' they were not being given a prescription and had received treatment advice, been taken seriously, reassured the problem should not worsen and given the option to return if they had further concerns.

However, there were exceptions as some patients continued to reconsult despite attempts to educate and reassure them. In such cases, participants indicated that they persisted with attempts to educate patients and modify their beliefs about antibiotics. Furthermore, some NPs recognized that reconsultation may be due to the emotional experience of being ill and thus recognized the need to continue to support patients:

When you feel well, and then feel ill again, you soon forget things. So that is when I say it doesn't matter how many times you come here...there is the support there. (NP6)

Discussion

Study limitations

As this study involved interviewing prescribers about their experiences, the results are necessarily subjective and may not be a reliable reflection of actual behaviour and experiences during RTI consultations. NPs may have responded to questions in ways they believed were expected and been reluctant to disclose examples that might be judged as poor practice. However, the non-judgemental stance adopted by the interviewers and the fact that NPs did at times describe what they thought of as inappropriate prescribing and struggles with patients, using concrete examples to support their statements, supports the trustworthiness of the findings. An observational study looking at NPs actual behaviour within RTI consultations would provide further validation.

The focus groups were undertaken as part of a training intervention, which may have introduced a bias in recruitment as health professionals may be more likely to undertake training in subjects that they value and feel more confident and skilled in (Salmon *et al.* 2007). Hence, it is likely that focus group participants were more motivated to use a no-prescribing strategy. Nevertheless, even amongst this group, challenges and lack of confidence were reported, suggesting that these aspects are likely to be even greater in the wider population of NPs.

Finally, although the study aimed to look at the experiences of a range of NMPs in managing RTI consultations, the final sample contained only two NMPs with non-nursing roles. Future work should explore in more depth the experiences of other prescribers who are responsible for patients with RTIs. It would be particularly beneficial to compare the experiences and practices of GPs, nurses, and other allied health professionals to gain a better understanding of how RTIs are managed across different primary care settings and how to reduce prescribing for these conditions.

NPs' experiences of RTI consultations

The results indicate that NPs face numerous challenges when dealing with patients with RTIs, some of which are similar to those described by GPs, such as perceived patient expectations of antibiotics and diagnostic uncertainty (Butler *et al.* 1998, Kumar 2003, Petursson 2005). However, NPs did not report feeling the same pressures of time and workload as GPs and most indicated that they would not prescribe due to patient pressure or other non-clinical factors. Instead, NPs identified tailored strategies for eliciting and managing

patients' concerns and expectations regarding RTIs. These included educating patients about causes of RTIs and antibiotics, giving self-management advice, and using techniques such as thorough examination to reassure patients that their illness did not require a prescription. NPs also highlighted the importance of empathizing with patients and having good communication skills. Finally, NPs utilized additional resources such as peer support, guidelines, and protocols, and patient information aids in guiding and reinforcing (non)treatment decisions. Taken together, the findings suggest that this particular group of prescribers are relatively comfortable with implementing a no-prescribing strategy for RTIs and have a repertoire of strategies that they can draw upon when dealing with patients.

Despite possessing apparently successful strategies for managing patient expectations without recourse to antibiotics, some NPs were cautious when making decisions about treatment, particularly where diagnostic ambiguity existed. Some NPs also reported being worried about making the wrong decisions and felt that they were under close scrutiny and lacked legal protection. Finally, NPs reported problems in relationships with GPs, particularly when GPs had undermined their prescribing decisions, and felt that some patients viewed them as lacking expertise and authority. Future work around this issue should focus on improving perceptions of NPs as skilled and competent prescribers and enhancing relationships between NPs and GPs.

Comparison with previous literature

The current findings correspond with those described in previous research investigating NPs and RTI consultations. A systematic review of UK primary care studies revealed similar results regarding patient satisfaction with NP treatment, amount of time NPs spend in RTI consultations and the tendency of NPs to give sufficient information to patients, particularly regarding self-management (Van Ruth *et al.* 2008). The results also align with the finding that nurses did not report being influenced by patient pressure for antibiotics when making prescribing decisions (Weiss 2004). However, the present study extends these findings by focusing solely on the experiences of NPs (rather than on comparisons with GPs) and providing a detailed picture of the various challenges faced by NPs during RTI consultations and the strategies used to manage these.

Historically, patient education has been a major feature of the nursing role and is a core part of the nursing curriculum (Tilley *et al.* 1987, Close 1988, Bastable 2008). Thus, the NPs' focus on educating patients about resistance, self-management, and the differences between viral and bacterial

What is already known about this topic

- Although most respiratory tract infections are viral and self-limiting, many patients receive antibiotics for these conditions.
- Over-prescription of antibiotics for respiratory tract infections, which are usually viral and self-limiting, is a significant problem in terms of wasted resources, increased resistance, and side-effects caused by treatment.
- General practitioners report a number of non-clinical reasons for prescribing antibiotics for respiratory tract infections, including patient expectations and time pressure.

What this paper adds

- Nurses frequently encounter patients with respiratory tract infections and report several challenges including patient pressure, diagnostic uncertainty, and scrutiny of their ways of working.
- Nurses have a repertoire of strategies for managing patients with respiratory tract infections, including eliciting and addressing patients' concerns, patient education, and self-management and using protocols and peer support to assist decision-making.
- Despite having a number of strategies for managing patients without recourse to antibiotics, some nurses lacked confidence in their abilities to make decisions regarding treatment and management of these patients.

Implications for practice and/or policy

- Training around respiratory tract infection management for nurses and other non-medical prescribers should emphasize the effectiveness of many of the strategies that they already use.
- Training for other health professionals responsible for respiratory tract infection management should include the strategies identified by nurses and other non-medical prescribers.
- Guidelines on managing respiratory tract infections should include guidance on how to implement the no-prescribing strategy whilst ensuring that this strategy is acceptable to patients.

illnesses and their apparent competence in this domain is perhaps unsurprising. However, these findings are valuable as research indicates that a significant proportion of patients

have limited or inaccurate knowledge regarding these factors (McNulty 2007) and it has been suggested that misinformation about the efficacy of antibiotics is an important factor in patient expectations of antibiotics (Macfarlane *et al.* 1997). Thus, supporting NPs and other prescribers in providing this type of education within RTI consultations may be an important factor in the drive to reduce antibiotic prescribing. Future research should therefore investigate which educational strategies are most successful in improving levels of knowledge and reducing antibiotic expectations and intentions to consult.

It should be noted that, while NPs reported advising patients on how to self-manage their symptoms, the techniques advocated differed across NPs and were not necessarily all evidence-based (Schroeder & Fahey 2002, Smith *et al.* 2008). For example, whilst a number of NPs reported advising patients to use over the counter medications, others expressed concern about the lack of empirical evidence for these products and indicated that they would not advise to use these. Training for NPs should aim to support the provision of self-management advice by indicating which techniques are effective.

The findings extend those from GP studies (e.g. Butler *et al.* 1998, Kumar 2003, Little *et al.* 2004, Petursson 2005, Hare *et al.* 2006) by indicating that NPs encounter different challenges and possess a different repertoire of skills when dealing with RTI consultations. Nurses described the need to be cautious in dealing with certain aspects of RTI consultations, particularly diagnostic ambiguity. This extends previous research investigating NP confidence with prescribing medications (Luker & McHugh 2002, While & Biggs 2004), but not their confidence in dealing with other aspects of RTI consultations. These results reveal another issue relating specifically to NPs' roles: concern about scrutiny of their work and legal protection. Previous work has highlighted the importance of clearly defining nurses' legal obligations and accountability regarding prescribing as this relatively new element of the profession has emerged (Courtenay & Butler 1999, Courtenay 2001). Studies also show that nurses found it helpful to learn about the legalities around prescribing (While & Biggs 2004) and that ambiguities around this can cause concern for them (Watterson *et al.* 2009). The present study illustrates that perceptions regarding these issues may affect NPs' prescribing practices within the context of making decisions about antibiotics for RTIs, and that despite reportedly engaging in cautious and considered prescribing, NPs concerns regarding such issues do not always subside.

Taken together, this suggests that any training for NPs should be tailored to their specific needs and knowledge, in particular by supporting the strategies already in place and

increasing confidence with regard to managing clinical ambiguity, and in terms of addressing concerns about the level of scrutiny under which their practices may be assessed. Furthermore, the present results could be useful in informing training across the different groups of prescribers (NPs, GPs and other allied health professionals).

Although the results from the present study came from nurse prescribers in the North West of England, the results are likely to be applicable to the rest of the UK and to other countries where nurses have prescribing powers (e.g. USA, Sweden, Australia, New Zealand; Wilhelmsson & Foldevi 2003, Moller & Begg 2005, Miles *et al.* 2006, CHSRP & Walton 2006, McMillan & Bellchambers 2007). This is particularly important as the present results indicate that nurses have different experiences of RTI consultations than GPs, thus if we are to make significant gains in reducing antibiotic prescribing, then this needs to be taken into account when considering research, training, and policy.

Conclusions

The present study reveals that most nurse prescribers feel equipped to manage patients with RTIs without recourse to antibiotics and perceive their strategies as being acceptable to patients. Future work should focus on investigating the efficacy of the self-management strategies identified by the nurses. Training for these prescribers should focus on reinforcing the use of these strategies and improving nurses' confidence in dealing with patients with RTIs. Furthermore, these results inform training and guidelines for GPs, as this group often reports difficulties in managing perceived patient pressure for antibiotics and describes feeling unable to refuse antibiotics whilst maintaining patient satisfaction and relationships (Peters *et al.* 2011). Finally, future research should focus on investigating the experiences of nurse prescribers in other countries and of other groups of prescribers (such as pharmacist prescribers) within the UK to assess the applicability of the present results to other prescribers and to identify specific training needs amongst these groups.

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Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

CCG, AW and SP were responsible for the study conception and design, and obtained funding. SC, SM and SP performed the data collection. SR, AC and SP performed the data analysis and were responsible for the drafting of the manuscript. SR, AC, SM, CCG, LC, AW and SP made critical revisions to the paper for important intellectual content. AC and SP provided administrative, technical or material support. SP supervised the study.

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