Clinicians' views and experiences of interventions to enhance the quality of antibiotic prescribing for acute respiratory tract infections

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Running title: clinicians' views of interventions to improve antibiotic prescribing

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30 references

3 Tables

Abstract

Background

Evidence shows a high rate of unnecessary antibiotic prescriptions in primary care in Europe and the United States. Given the costs of widespread use and associated antibiotic resistance, reducing inappropriate use is a public health priority.

Objective

To explore clinicians' experiences of training in communication skills and use of a patient booklet and/or a C-reactive protein (CRP) point of care test to reduce antibiotic prescribing for acute respiratory tract infections (RTIs).

Design

Qualitative research interviewing clinicians who participated in an RCT testing two contrasting interventions.

Participants

General practice clinicians in Belgium, England, The Netherlands, Poland, Spain and Wales.

Approach

Sixty-six semi-structured interviews were transcribed verbatim, translated into English where necessary, and analysed using thematic and framework analysis.

Key Results

Clinicians from all countries attributed benefits for themselves and their patients to using both interventions. Clinicians reported that the communication skills training and use of the patient booklet gave them greater confidence in addressing patient expectations for an antibiotic by providing answers to common questions and supporting the clinician's own explanations. Clinicians felt the booklet could be used for a variety of patients and for different types of infections. The CRP test was viewed as a tool to decrease diagnostic

uncertainty, to support non-prescription decisions, and to reassure patients, but was only necessary when clinicians were uncertain about the need for antibiotics.

Conclusion

Providing clinicians with training and support tools for use in practice was received positively and was valued by clinicians across countries. Interventions seemed to have influenced behaviour by increasing clinician knowledge about illness severity and prescribing, increasing confidence in making non-prescribing decisions when antibiotics were unnecessary and enabling clinicians to anticipate positive outcomes when making such decisions. Addressing such determinants of behaviour change enabled interventions to be relevant for clinicians working across different contexts.

Key words: Qualitative research, decision making, antibiotic prescribing, communication training, point of care testing, primary care**.**

Introduction

Effective uptake of new evidence in routine clinical care is challenging and many barriers and enablers have been identified [1]. Improving clinical practice, which includes offering clinicians choice in how they learn, is dependent on physicians' sense of how important the proposed intervention is and its feasibility [2]. Interventions that are most effective in clinical trial settings may not necessarily be those that clinicians prefer to learn, find easiest to use, prioritise to implement or are most suitable for their practice environment.

As an example of this, various intervention strategies to reduce unnecessary antibiotic prescribing in general practice have been suggested, such as point of care test (POCTs) and enhanced communication skills [3-5]. However, they have generally been designed for implementation in a single context [6-7] and focused on a single country, health care organisation and culture.

While randomized trials have demonstrated the clinical and/or cost-effectiveness of these interventions, other study designs are best suited to generate or explore hypotheses about why and how interventions are effective or ineffective and how those exposed to the intervention use it in their daily practice [8-10]. An understanding of clinicians' views and experiences of using different interventions in practice, in relation to their patients, can help identify the 'active ingredients' of a complex intervention, explore the feasibility, acceptability, and transferability of the intervention, and thus help inform refinement and implementation. Exploring whether an intervention that has been shown to be effective across multiple European countries has different levels of acceptability or is used in different

ways in different countries may provide opportunities for changing clinicians' behaviour on a wider scale without having to repeat clinical trials in each new setting.

The aim of the present study was to explore the experiences of using two contrasting interventions (communication skills training with the use of a patient booklet discussed in the consultation with a patient, and the use of a point of care test) to help promote prudent antibiotic prescribing for acute respiratory tract infections (RTIs) among clinicians working in different European settings. We aimed to explore how clinicians used the interventions in their daily practice and how attitudes, beliefs and practices varied between countries.

Methods

The GRACE INTRO Intervention

The GRACE INTRO (Genomics to combat Resistance against Antibiotics in Community-acquired LRTI in Europe INternet TRaining for antibiOtic use) study was a large, multinational cluster randomised factorial trial evaluating two contrasting interventions to reduce antibiotic prescribing for adults with acute RTIs in Belgium, England, the Netherlands, Poland, Spain and Wales [11]. The trial included patients with acute upper and lower RTIs. In order to operationalize this we defined lower respiratory tract infection as an illness of up to 28 days duration with acute cough as the main or predominant symptom, or a clinical diagnosis of LRTI where cough was not the main symptom.

GRACE INTRO was a 2x2 factorial design, with clinicians exposed to one, both, or neither of two interventions. All clinicians in the three intervention arms received a web-based intervention. The intervention consisted of three modules; an introduction, training in use

of a C-reactive protein (CRP) point of care test and training in communication skills (including use of a patient booklet (Table 1). Training was developed through piloting intervention materials with clinicians in all participating countries [12]. Clinicians received either all three modules, or the introduction module and one of the two training modules depending on the trial arm they were in. The control arm did not receive a web-based intervention.

A detailed account of the GRACE INTRO trial is presented elsewhere [11]. The trial showed that both interventions were effective in safely reducing antibiotic prescribing for RTIs, and the combined interventions reduced antibiotic prescribing the most. This qualitative study presents part of the process evaluation of the trial. Patient views of taking part in the trial are reported elsewhere [13].

Study Population

Clinicians were purposively sampled from those who took part in the GRACE INTRO trial [11] to obtain a range of clinicians from each of the six countries, in each of three intervention arms. Clinicians were invited to participate in the study by email or phone and all who were asked to participate, agreed. Participants were unaware of the trial results at the time of interview. The relevant local ethics committee in each country granted ethical approval for the study.

Study design

Clinicians were interviewed face to face in their own practice or, in two cases, by phone due to location. Interviews followed a semi-structured interview guide, which was developed collaboratively by the team and then translated into the relevant languages (Appendix 1).

Interview questions asked about how clinicians used the interventions, what motivated them to use the interventions, how they integrated interventions into their consultations and what was most helpful for them in caring for their patients. Six experienced primary care researchers conducted interviews in their respective countries and received training beforehand. The interviewers were all familiar with the intervention content although had not designed the intervention themselves. All interviews were digitally recorded and transcribed verbatim. Interviews undertaken in all countries other than England and Wales were translated into English and the original interviewer checked these translations to ensure accuracy.

Analysis

Analysis followed techniques from thematic and framework analysis [14,15]. The first stage of analysis used an inductive thematic analysis method [14], which allowed the development of themes grounded in the original data. Two researchers (STC and SA) independently coded 32 interviews, at least one interview from each of the three intervention groups for each of the six countries. Segments of text related to the research question were identified and labelled to create initial codes. Codes were renamed and refined as further transcripts were coded. Each researcher then examined codes for similarities and differences and grouped codes accordingly to create categories and an initial thematic framework. Following this independent coding, the two initial frameworks were compared and similarities and differences discussed and amended to create a set of themes that represented both analyses. Descriptions of each theme and sub-theme were added, along with quotes to support each. In order to ensure the clarity of the themes, this initial framework was discussed with two other researchers (NF and JC). In a second stage of the analysis, the

remaining 34 interviews were analysed by SA using techniques from framework analysis to code data to the existing framework [15]. Data that did not fit under existing themes were coded as new codes and included as additional themes or subthemes after discussion with STC, NF and JC.

Results

Participant characteristics

Sixty-six clinicians were interviewed across the six countries (Table 2). Similar numbers were recruited from each intervention arm and country. All interviews took place between April and June 2011. Interviews ranged in length from 9 to 35 minutes with a mean of 20 minutes. There were no major differences in interview lengths between countries. Clinicians from Belgium were on average slightly younger than clinicians from other countries and subsequently had fewer years of experience but otherwise clinicians' characteristics between countries were similar (Table 3).

Qualitative Findings

Four themes emerged from the data analysis. Themes were applicable to participants from each intervention arm and each country unless otherwise stated.

Acceptability of the interventions and perceived barriers to use

In general, clinicians were positive about both interventions. Clinicians found the CRP test acceptable because they felt it reduced diagnostic uncertainty, which could help them make evidence based decisions, although some had problems using the semi-automated device.

Clinicians felt that the test was difficult to incorporate in practice, particularly in single-handed practices.

> *"The trouble was [the CRP test] took so long and it was quite fiddly…" (England, clinician 4, Communication and CRP group)*

For the trial, clinicians were asked to use the test for all patients for whom they were considering prescribing an antibiotic. However, many did not use the test when they had already decided to prescribe. This reflected the likely use of the test in daily practice but meant the test did not influence those GPs who were certain about the need for antibiotics, whether correct or not.

> *"I got accustomed to the test very quickly and I know that it is an aid only in cases of doubt. If I know that I have to give antibiotics, I don't do the test; if I know that they are not needed, I don't do it either, and certainly, when one has doubts it's when the test really works for you." (Spain, clinician 1, Communication and CRP group)*

Clinicians were generally positive about the communication skills training although some felt it involved skills which they already possessed. The majority of clinicians reported that they felt the booklet would be helpful in routine practice and easy to use.

> *"I often pointed out the chapter about how to improve your immune system, what you can do yourself in order to cure the cough or what you can use from the pharmacy... the booklet gave more structure to the consultation." (Belgium, clinician*

4, Communication and CRP group)

"There are a lot of [patients] who immediately understand what you are saying. Others have doubts and that is when I used the booklet during the consultation and told them to reread it carefully at home, so they had impeccable proof of the current scientific issues. In order to persuade people and make them understand your policy, the booklet was very useful." (Netherlands, clinician 12, Communication only group).

In contrast to the CRP test, some clinicians reported that the booklet had saved time in their consultation. Although this was reported as a positive, some of them gave patients the booklet without any discussion of its content, which lost the interactive aspect.

How interventions may have impacted on antibiotic prescribing

Clinicians reported that both interventions helped them to prescribe fewer unnecessary antibiotics. Many who had used the CRP test reported that it had helped to reduce their diagnostic uncertainty in cases when they had doubts about illness severity or had helped to convince patients that antibiotics were not needed.

"[The CRP test] helped me to evaluate the necessity or non-necessity of prescribing antibiotics when the clinical history or the physical examination led to doubts about the diagnosis." (Spain, clinician 1, Communication and CRP group)

Clinicians exposed to the communication skills intervention commented on the focus of educating patients, as well as examining and treating patients.

> "*We'd initially been disappointed, because we'd wanted to do more exciting things (the CRP test), but actually it was really good and changed our perspective on the education part of it and the communication and education of patients rather than the examination, testing and investigating part." (England, clinician 2, Communication only group).*

With the booklet, clinicians felt that they could give a positive message to their patients by explaining what they could do to relieve their symptoms and, as such, help to empower patients. Clinicians reported that the booklet was particularly helpful when explaining non-antibiotic prescribing decisions as it reminded them of specific points to cover and gave them a coherent structure for their consultation.

Clinicians felt that the 'safety netting' section in the booklet addressed patient's concerns by alerting patients to 'red flag' signs and symptoms suggestive of a more severe illness. Clinicians reported that they felt more comfortable managing patients without prescribing antibiotics when patients had this information to refer to.

Some clinicians felt that having tools to 'back up' their decision helped to convince patients that antibiotics were not needed. The CRP and booklet both helped to do this, either by providing written information or a test result, which was an independent source from the clinician. The CRP test was perceived to reassure patients as they had an independent, objective measure of their illness.

"The CRP cut offs were really useful, you put [them] in front of the patient while you're fiddling around [with the test] and they're bored and they read [them] and then when you say "oh yours is less than 10" they actually believe you, it was quite useful to have in black and white." (England, clinician 3, CRP only group)

Finally, some clinicians commented that they had gained new knowledge through the interventions. Many stated that they had been unaware that the usual natural history of cough was so long and that lengthy coughs did not necessarily benefit from antibiotic treatment.

"It struck me that the duration of cough can be so long. After a while people don't come back and you lose track of the fact that a cough can last for such a long time. That was made really clear during the training. It gives a solid ground for your diagnosis, because you can tell your patient that he will have to wait a while before the cough disappears." (Belgium, clinician 11, Communication and CRP group)

"It really conveys some surprising information… There was a piece of information saying that the duration of an illness is only one day shorter when an antibiotic is prescribed. So these things are... really surprising." (Poland, clinician 9, CRP only group)

Intervention effects on future consulting

Clinicians often mentioned the potential effect of interventions on future consultations for acute RTIs. Some clinicians who had received the communication skills intervention felt that

the booklet and discussion they had had with patients may help to reduce future consultations by patients gaining a greater understanding of infections and the necessity, or not, of antibiotics.

> *"There were people who were not convinced that they would manage to fight their illnesses without the use of antibiotics. I had to devote more time to such people; however, later on they told me that in fact antibiotics were not needed."(Poland, clinician 16, Communication only group)*

Clinicians' views were more mixed regarding the CRP test. Some felt that performing the test would help patients understand that antibiotics were not needed for acute RTIs, while others felt that tests might encourage patients to consult in the future, especially if they had a high CRP result on one occasion.

> *"To one [patient] I explained what the test consisted of and what it meant. He got a very high result so I gave him antibiotics. He said that he would come every time to the office whenever he felt like that. And then I thought, won't we be creating a greater dependency to the patient on us?" (Spain, clinician 10, CRP only group)*

Complementarity of the interventions

Clinicians who used both of the interventions reported that they were complementary. The CRP test was seen as most useful when patients were more unwell and there was uncertainty about infection severity. The communication skills and booklet were seen as

useful when antibiotics were not needed but a patient required an explanation as to why. Many clinicians felt that the booklet would be useful for a larger proportion of patients.

> *"I hope to keep using the booklet for a long time. I think there should be a pile of them in every practice because it's such a common condition. In winter time, not a day passes without a bronchitis patient walking in…This booklet is really useful for us." (Belgium, clinician 14, Communication only group)*

Some clinicians reported that they would use both interventions for some patients, as they could be synergistic. Clinicians felt whilst the test was useful when they were in doubt about the diagnosis, they still needed communication skills either to explain the results of the test and/or to address patient expectations about antibiotics.

> ***"****I found the interventions were useful in slightly different groups of patients, some overlap probably because again I would use this booklet for a patient who was just borderline, whose CRP was just raised especially this safety netting section at the end, to explain what to do and what signs to look for." (England, clinician 11, Communication and CRP group)*

Discussion

This was the first qualitative study to explore clinicians' experiences of two contrasting interventions across different countries. In general, the views expressed by clinicians were

remarkably similar across countries and both interventions were seen as acceptable for use in primary care. Clinicians reported that the patient booklet helped them structure their discussions with patients and educated patients about their illness and how to manage it appropriately whilst maintaining satisfaction. Clinicians felt the booklet was suitable for the majority of patients with acute cough and those who discussed the booklet reported positive responses from patients. Some clinicians did not discuss the booklet with patients and/or did not engage with the communication skills training, this may have reduced the impact of the intervention. The CRP test was valued by clinicians as it gave additional diagnostic information that reduced uncertainty. In addition, clinicians felt that the test provided support for not prescribing antibiotics, which they perceived as unnecessary and provided reassurance to patients. Whilst useful, clinicians indicated that they would restrict use of the test to cases of diagnostic uncertainty because of the time taken to obtain a result.

Use of the interventions appeared to provide clinicians with more confidence in their ability to withhold antibiotic prescriptions when they felt they were unnecessary. Intervention content was based on theories of behaviour change and particularly focused on increasing self-efficacy, one's belief that one can carry out a particular behaviour at a given time [16,17]. Clinicians reported being more confident in diagnosing an infection when using the CRP test and in explaining a non-prescribing decision to patients and this appeared to be a result of training videos provided within interventions. Clinicians' expectations of the outcome of a consultation are also likely to have changed. Having materials to support a non-prescribing decision, whilst maintaining patient satisfaction, is likely to have enabled clinicians to envisage positive outcomes of non-prescribing decisions. These expectations would be further reinforced once clinicians saw positive responses from patients in practice.

Lastly, clinicians reported gaining new knowledge from the interventions which may have changed their beliefs and/or attitudes towards prescribing for acute infections and subsequently changed their intentions to prescribe. Such determinants of behaviour are relevant for all clinicians, regardless of the context in which they work, and interventions which address such determinants are therefore likely to influence target populations as long as intervention materials are delivered in an acceptable and relevant format.

These results support existing qualitative research. Previous international studies found that clinicians value POCTs as an intervention to help reduce unnecessary antibiotic prescribing [18,19]. However, these studies asked about hypothetical, rather than actual, use. Research with clinicians who had used a CRP test found similar results to the present study, with clinicians reporting that the test was useful for reducing diagnostic uncertainty but that it needed to be simpler to use [5,20]. A more recent study found that UK clinicians were initially sceptical about the use of POCTs and experienced problems using them in practice, however over time these issues diminished [21]. A third study [22] identified that clinicians' preferences for interventions changed after having experience in using the interventions. Clinicians initially favoured POCTs over communication skills however reversed their preference after trialling both. This result was similar to the current study with clinicians reporting that communication skills and patient booklet would be of value to more patients that the CRP test. It is important to recognise, however, that antibiotics are more likely to be prescribed in the face of clinical uncertainty which only the CRP test addresses [23,24,25]. Lastly, the results supported the quantitative evaluation of GRACE INTRO which indicated that clinicians perceived reducing prescribing as less risky following the intervention, and clinicians in the communication group reported increased confidence to reduce prescribing

[17].

Previous qualitative work has also explored clinicians' views of communication skills training as a way to promote prudent prescribing. The STAR study evaluated a multifaceted educational intervention delivered through both online and outreach visit training, and was centred on communication skills [26-16]. Clinicians reported that communication skills training gave them an additional insight into their patients' agendas, which they felt would reduce future unnecessary consultations but required an initial investment of longer consultations. The current study found that only a minority of clinicians mentioned the advantage of the communication skills specifically and most concentrated on the benefits of the patient booklet. This is consistent with research done by Mc Dermott et al., which suggests that clinicians do not want education but instead a tool that will help them make correct decisions which can be implemented easily [27]. The STAR Study intervention did not incorporate the use of a specific interactive booklet. This may mean that the presence of a booklet overshadowed the communication skills for clinicians, or that they subconsciously used the communication skills while discussing the booklet with patients. Using (interactive) booklets in RTI consultations has shown to be effective at helping to reduce prescribing by clinicians and reducing intentions to consult by patients [6,28,29]. Our results are consistent with a qualitative evaluation of use of an interactive booklet in children in which use of the booklet was shown to increase clinician confidence in adopting a non-prescribing approach, and increased knowledge about the management of RTIs. [28]

One limitation of this study is the use of six interviewers. Each interviewer followed the same interview guide but may have had differences in their interviewing style that may have

influenced participants' responses. Researchers were satisfied that there were no significant differences between quality or length of interviews between interviewers after examining the data. In addition, study participants were invited from a pre-existing group of clinicians who had agreed to take part in the main trial. The trial required clinicians to undertake a number of tasks and lasted several weeks and therefore they had to be well motivated to participate and complete the trial. This may have led to clinicians giving more positive feedback and generally being more motivated to implement the interventions in their practice. We were encouraged to find that all participants in this study freely reported their negative views on aspects of the intervention indicating that they were comfortable critiquing the interventions and in providing suggestions for improvements.

Despite these limitations, our study provides useful new information. While the CRP test was seen as a useful diagnostic tool, clinicians felt it could be easier to use. Clinicians also had mixed feelings about whether or not the test would reduce re-consultations in the future. Recently, a long term evaluation of a previous trail showed that using CRP POCT does not lead to increased consultations for similar illnesses [30]. It is likely that the CRP test in its current form would be difficult for clinicians to implement, especially if working single-handedly. However, a test, which is even quicker and simpler to use, would likely be well received. New test platforms allow CRP ascertainment in a single-step test procedure with an overall time of finger prick to test result in less than four minutes. While CRP does not directly improve individual patient outcomes, it does protect patients from receiving unnecessary antibiotics including side effects, and thus investment will lead to improved antibiotic stewardship and reduced antibiotic resistance rates. Therefore, investing in a tool that has wider societal implications is also important.

Conclusion

Interventions were seen as acceptable and useful to clinicians across all countries. The patient booklet helped to provide advice for patients and a structure for discussion in the consultation. The CRP test decreased diagnostic uncertainty and supported non-prescription decisions. Interventions appeared to work by increasing clinicians' confidence in making non-prescribing decisions and adjusting their expectations of how patients may react to non-prescribing decisions. Interventions were also seen to improve clinicians' knowledge about the management of acute RTIs. Addressing such determinants of behaviour change enabled interventions to be relevant for clinicians working across different contexts.

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Author contribution

All authors participated in study concept and design and preparation of the manuscript. SA and STC participated in moderation of interviews, transcript analysis and interpretation, and they take responsibility for the manuscript as a whole. JWC and NAF participated in interpretation of the analysis. PFV, JK, CL, LBH participated in moderation of interviews, checking interpretation and preparation of analysis. All authors read and commented on different versions of the manuscript.

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Prior Presentations

Presented at the General Respiratory Infections Network (GRIN) Annual meeting 2012, Bristol, UK; the South West Society of Academic Primary Care (SW SAPC) conference 2012, Torquay, UK and the 41st Annual Scientific Meeting of the Society of Academic Primary Care (SAPC) 2012, Glasgow, UK. Presentation entitled: “Exploring clinicians’ views across six countries of a near patient test and/or communication skills training as techniques to decrease inappropriate antibiotic prescribing for acute cough”.

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562 **Table 1:** An overview of the content of the web-based training for the intervention arm
563 receiving both interventions.
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Module 1: General introduction
(Seen by all three intervention arms)

- Background to the problem of over-prescription of antibiotics regarding healthcare, patients, RTIs and clinicians.

Module 2: Training in communication skills with use of a patient booklet.
(Seen by two communication intervention arms only)

- Description of the three key elements of an effective consultation (to gather information, exchange information and check information).
- Clinicians provided with examples of questions to ask patients in the consultation.
- Introduction of patient booklet.
- Video clips showing example consultations between GPs and patients with clinicians using the communication skills and discussing the patient booklet.

Module 3: Training in the use of a C-reactive protein (CRP) point of care test.
(Seen by two CRP intervention arms only)

- Introduction to the CRP test as a method to assist diagnosis of respiratory tract infections.
- Training in how to use the test including instruction videos.
- Explanation of how to interpret test results.
- Instructions on how to incorporate a test into a consultation.

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Table 2: The number of interviews carried out with clinicians across countries in each intervention arm of the GRACE INTRO trial.

	Training in use of CRP test	**Training in communication skills and use of patient booklet**	**Training in CRP test + communication skills and use of patient booklet**	**Total**
England	3	3	4	**10**
Wales	2	1	3	**6**
Spain	4	5	6	**15**
Belgium	4	4	3	**11**
Netherlands	4	4	4	**12**
Poland	4	4	4	**12**
Total	**21**	**21**	**24**	**66**

571 **Table 3:** Mean age and years of clinical experience for clinicians by country.

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	Age (mean, yrs)	Practice experience (mean, yrs)
Belgium	39.9	14.1
England	51.6	20.7
Netherlands	49.2	17.8
Poland	44.8	18.8
Spain	41.7	15.3
Wales	48.2	16.0
Total sample	**45.4**	**17.0**

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Appendix 1: The interview schedule used with clinicians.

Clinician Interview Schedule

For all clinicians:

1. Could you start by giving me your general impressions of taking part in the study?
   Prompts:
   a. How was the contact with the study team?
   b. Did the training meet your expectations? Could you explain why/why not?
   c. Were there any aspects of the study that you particularly liked? Could you explain why/why not?
   d. Were there any aspects of the study that you thought were problematic or did not work well? Could you explain why/why not?

2. Did any part(s) of the training help you to increase your knowledge and/or skills during your consultations for LRTI/cough?

For clinicians who had recieved CRP training:

3. I'd now like to ask you a bit more about the CRP training and the use of the CRP test.
   Prompts:
   a. What were your impressions of the CRP online training?
   b. Did you complete the CRP online training?
   c. Did you find it helpful? Why/why not?
   d. Were there any sections that you found particularly helpful?
   e. Were there specific things in the training that you did not like or sections you would have liked removed?
   f. How did the training help you to use the CRP device and interpret the results?
   g. Were there any barriers to doing what we asked you to do, or to using the CRP test?
   h. Did the training help you to manage patients with cough/ LRTIs?
   i. Do you think there are any barriers to implementing the training?
   j. What was your experience with the length of the training?

4. Did you use the CRP test as a tool within consultations or did somebody else within the practice do the test?
   Prompts:
   a. If you didn't use the CRP test, can you tell me why you decided not to use it?
   b. If yes, can you tell me what it was like using it in the consultation?
      i. What worked well? What did not work well? How did it influence your consultation?
   c. How did you use the results of the test in your decision about whether to prescribe antibiotics or not?
   d. What do you think patients thought of the CRP test?

For clinicians who had received communication skills training:

5. I'd now like to ask you a bit more about the communication skills training and the use of the patient booklet.
   Prompts:
   a. What were your impressions of the communication skills online training?
   b. Did you complete the communication skills online training?
   c. Did you find it helpful? Why/why not?
   d. Were there any sections that you found particularly helpful?
   e. Were there specific things in the training that you did not like or sections you would have liked removed?
   f. How did the training help you to use the patient booklet?
   g. Were there any barriers to doing what we asked you to do, or to using the booklet?
   h. Did the training help you to manage patients with cough/ LRTIs?
   i. Do you think there are any barriers to implementing the training?
   j. What was your experience with the length of the training?

6. How did you use the booklet as a tool within consultations?
   a. If not used, can you tell me why you decided not to use it?
   b. If used, can you tell me what it was like using it in the consultation?
      i. What worked well? What did not work well? How did it influence your consultation?
   c. What do you think patients thought of the booklet?

For clinicians who had recieved CRP and communication skills training:

7. In what way have you used both interventions in your practice?
   a. Have you used them together or separately?
   b. What influences your choice in using one or both techniques?
   c. What are the advantages and disadvantages of using them together or separately?
   d. Have you got a preference for one or the other and why?

For all clinicians:

8. How has participating in the study changed your prescribing behaviour or the way you manage cough or LRTIs?

9. How useful did you find the training and how easy was it to use in daily practice?

10. How do you feel the intervention impacted on the doctor-patient relationship?

11. Do you have any other comments or points you would like to make about managing cough or lower respiratory tract infections or taking part in the study as a whole?