

Community pharmacists' views on their current role and future opportunities for antibiotic stewardship: a French qualitative study

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Background: Different healthcare professionals should contribute to antibiotic stewardship (ABS) activities. Involvement of community pharmacists (CPs) has been little explored worldwide to date.

Objectives: To explore French CPs' views on ABS and antibiotic resistance, their role and current practices, and future opportunities for ABS.

Methods: A qualitative study using semi-structured face-to-face individual interviews was performed from May to October 2019 among CPs from north-eastern France. Transcripts of the interviews were analysed using a thematic analysis.

Results: Twenty-seven interviews were conducted. Most participants had a clear understanding of antibiotic resistance and ABS. They considered themselves as 'guardians of the appropriate use of drugs' but often failed to fulfil this mission because of difficult relationships with physicians. Their current ABS practices are: (i) counselling patients about the antibiotic treatment; and (ii) reporting to the prescriber when they identify contraindications/drug interactions. Concerning their potential increased involvement in ABS, CPs felt they could perform more rapid diagnostic testing for sore throat; they were divided on the possibility for them to change the antibiotic prescription made by a physician and were mainly against the possibility of initiating an antibiotic prescription. The idea of systematically collecting unused antibiotics was perceived well by CPs, while unit dose delivery was not.

Conclusions: French community pharmacists are willing to become more involved in ABS activities. Collaboration and trust between pharmacists and prescribers should however be improved.

Introduction

Antibiotic resistance is a public health issue caused mostly by the overconsumption and misuse of antibiotics.¹⁻³ In France, most antibiotics are prescribed in the community setting (81% in 2015), especially by general practitioners (GPs) who are responsible for 70% of those prescriptions.⁴ Since the 2000s, antibiotic stewardship (ABS) activities have thus been implemented, especially in French primary care (e.g. training of healthcare professionals, feedback to the GPs on their prescriptions, pay for performance).^{5,6} Although consumption of antibiotics has declined since then in France, it still remains 30% higher than the European average.⁷⁻⁹

Community pharmacists (CPs) have a key role to play in ABS. They are often the most accessible healthcare professionals (geographical proximity, free consultation without appointment) and are in a unique position to educate patients and to provide triage for common primary care conditions.^{10,11} In France, CPs' role in ABS is mostly limited to date to the transmission of information to patients and counselling.^{12,13} However, since 2009, French CPs have been encouraged to have a more active public health role, by performing prevention, screening, rapid diagnostic testing or educational interventions.¹⁴ In 2016, regulations went further, supporting the diversity of pharmaceutical practices, particularly in the context of antibiotic resistance.¹⁵ Indeed, CPs' role in ABS has since been

extended to rapid diagnostic testing for sore throat and, more recently, to flu and COVID-19 testing and vaccination.

However, CPs' knowledge and skills may be used to perform other activities, as is the case in other countries, such as: (i) prescription or delivery of some targeted antibiotics after a point-of-care testing;^{12,15–18} (ii) structured collaboration with GPs as part of an agreement between both professionals;¹⁶ and (iii) delivering the exact number of antibiotic pills for the treatment prescribed (unit dose delivery).¹⁹

Few studies^{20–26} and one systematic review²⁷ have been performed to evaluate CPs' knowledge, perceptions and current practices towards ABS. Four survey studies were conducted in Pakistan, two each in Australia and the UK, and one in each of Malaysia, Qatar, Canada, China, Jordan and Ethiopia. Eight surveys were conducted recently.^{20,21,24,25,27} Only three of them, conducted recently in Pakistan and two in the UK, were qualitative ones, which allow to explore an in-depth point of view^{22,23,26} and none investigated potential expanded CP missions.

We performed a qualitative study to explore French CPs' views on: (i) antibiotic use/resistance and ABS; (ii) their role and current practices in ABS; and (iii) the future potential opportunities for ABS given the evolution of their profession.

Methods

Study design

We performed a qualitative study using semi-structured face-to-face individual interviews with CPs working in two regional areas of north-eastern France (Meurthe-et-Moselle and Meuse), between May and October 2019. The study follows the COREQ reporting guidelines (see Table S1, available as [Supplementary data](#) at JAC-AMR Online).²⁸

French context regarding the antibiotic delivery process and ABS in community pharmacies

In France, antibiotics are delivered by CPs only on medical prescription, and these prescriptions should comply with existing national Best Practice Guidelines in infectious diseases, in particular those published and regularly updated by the French National Authority for Health.²⁹ As part of the medication delivering process, the CPs' role is to: (i) analyse the medication order (by checking the dosage, duration of treatment, absence of contraindications and drug interactions or redundancies and by checking that the medication order complies with regulatory requirements); (ii) validate it; and (iii) when delivering the medication, give patients advice about the antibiotic and its appropriate use.³⁰ All this process is called 'medication dispensation'.

CPs deliver the number of packages necessary to cover the duration of the treatment prescribed. This may exceed the exact number of pills required and produce leftovers. Some patients may keep leftovers and self-medicate or share their antibiotics with relatives.^{19,31} Patients are however encouraged to return unused drugs (including antibiotics) to their pharmacist for safe disposal through the French system for retrieving and disposing of unused drugs called *Cyclamed*[®], in place since 1993 (this system does not include any incentive for patients).³²

Since 2016, French CPs have been authorized to use three types of point-of-care testing (POCT), including for sore throat (streptococcal test) and influenza. However, rapid diagnostic testing for sore throat has been reimbursed for CPs by the French National Health Insurance Fund since February 2020.³³ The measure has been suspended since March 2020 due to the COVID-19 pandemic.

Participants and setting

Firstly, we randomly selected 60 community pharmacies among the 320 pharmacies present in the study area [list provided by the Regional Pharmacist Society of Grand Est (URPS)]. Randomization was stratified by the pharmacy location (urban, suburban or rural area) with a planned final sample target of around 30 pharmacies agreeing to participate (10 in urban, 10 in suburban and 10 in rural areas) or fewer if data saturation was reached before. According to the literature, an heterogeneous sample of about 20 individuals is generally considered to be sufficient to reach data saturation.^{34–36} However, randomization of an additional sample of 10 pharmacies was planned if data saturation was not reached with the first sample.

Secondly, we contacted the selected pharmacies by phone to explain the study's objectives, and then recruited by e-mail one graduate CP by pharmacy who agreed to participate. The restriction to one CP by pharmacy was motivated by the fact that CPs practicing in the same pharmacy often share the same perceptions of their current or future missions. Other professionals working in the pharmacy (e.g. technicians, pharmacy students) were not eligible.

Semi-structured interviews

The interviews followed an interview guide (Appendix S1) composed of open-ended questions exploring CPs' perceptions regarding three main topics: (i) antibiotic use/misuse and antibiotic resistance; (ii) pharmacists' current role in ABS; and (iii) the potential evolution of the pharmacists' missions towards ABS. At the end of the interview, participants also completed a short questionnaire on their sociodemographic characteristics (Appendix S2). The interview guide was developed by a multidisciplinary team composed of one infectious disease physician (C.P.), two public health specialists (one junior, one senior) with expertise in qualitative studies (A.E., N.T.) and two community pharmacists (J.G., C.W.), through an informal consensus based on an exhaustive literature review on antibiotic stewardship and CPs, and collective discussion.

The interviews were face-to-face individual interviews conducted on the premises of each participating pharmacy by students (A.E., public health, and A.P., pharmacist) trained in qualitative research interviews and analysis, and the expected duration was about 1 h. After an oral consent, all the interviews were recorded (to avoid incorrect or missing data) and transcribed. Participation was voluntary and not compensated. After the first interview, the two interviewers reviewed the transcripts and discussed with the multidisciplinary team whether some adjustments were needed to increase the relevance and the understanding of the guide questions.

Analysis

A thematic analysis was used to analyse transcripts with QSR International's Nvivo 12 software. An analysis grid was developed by the students who conducted the interviews after an independent analysis of 10% of the transcripts and was validated by the public health and infectious disease specialists. Each theme and subtheme were discussed until a consensus was reached. Each interview was then coded according to this grid.

Ethics

No ethical approval was required for such studies exploring perceptions in accordance with French law.

Results

Data saturation was reached after interviewing 27 CPs (from 27 different pharmacies) and we had to contact a total of 40

Table 1. Community pharmacists' characteristics ($n = 27$)

Characteristic	N (%)
Location of the pharmacy	
rural	9 (33)
suburban	9 (33)
urban	9 (33)
Sex	
male	13 (48)
Age, years	
[20–30[6 (22)
[30–40[4 (15)
[40–50[8 (30)
[50–60[6 (22)
≥60	3 (11)
Number of years of practice	
<5	6 (22)
[5–10[2 (7)
[10–20[8 (30)
≥20	11 (41)
Pharmacy's owner	16 (59)
Recent training in infectious diseases ^a	3 (11)

^aAny post-university training in the year prior to the interview.

pharmacies to recruit these participants (participation rate = 67.5%). Characteristics of participants are presented in Table 1. About half were men, and the majority had at least 10 years of professional experience.

CPs' views on ABS and antibiotic use/misuse (Table 2)

Most participants (24/27) had a clear understanding of ABS, and of the different aspects that it includes. When asked about the importance of ABS, most CPs (19/27) first cited the risk of antibiotic resistance, perceived as an emerging public health issue.

The misuse of antibiotics perceived by almost all participants (22/27) was mainly due to prescribers' (mostly GPs) poor prescription practices. Participants often expressed harsh judgements about GPs, who 'prescribe however they want' without complying with guidelines (regarding molecule, dosage or treatment duration), yield to patient pressure, do not perform POCT and prescribe antibiotics in viral infections to prevent 'superinfection'. Some CPs (14/27) mentioned that it was urgently needed to remind physicians of guidelines on antibiotics.

Most participants (20/27) also reported patients' inappropriate practices, including self-medication, pressure put on GPs to prescribe or on CPs to obtain antibiotics without prescription, and discontinuation of treatment earlier than prescribed when symptoms improve. Such pressure was perceived to be due to the fact that patients consider antibiotics as the only treatment to stay active despite the illness. Most CPs (16/20) perceived patients as being highly demanding for antibiotics, but a few of them (5/27) reported that patients were increasingly aware of messages they provided regarding ABS.

CPs' views on their current role and practices (Table 3)

CPs' view of their role

Many participants (20/27) suffered from a lack of recognition of their profession. While they considered themselves as 'guardians of the appropriate use of drugs', CPs (12/20) felt to be perceived as mere salesmen of drugs, deliverers of drug prescriptions. Some participants (7/20) also reported that GPs positioned themselves 'above' the pharmacists. CPs felt that this lack of recognition prevented them from carrying out properly their 'guardian functions'.

Counselling patients

Providing information to or counselling patients was the main ABS action, done by all participants. When they deliver antibiotics to patients, CPs systematically reported providing advice on intake, respect of duration ('do not stop the treatment before the end, especially not when symptoms disappear'), reconstitution of oral suspension (judged as very poorly done by patients), adverse events and the importance of not sharing the treatment with relatives or not using it for another infection. A minority (3/27) even took advantage of this time to make patients aware of antibiotic resistance.

Medication order analysis and validation

When analysing orders, CPs may face prescriptions of antibiotics that they consider inappropriate. If they identify a contraindication or a drug interaction issue, all participants declared they contact the GP to discuss the prescription. If they identify that the choice of the molecule or the dosage is not appropriate according to guidelines, only CPs who have good relationships with the GPs (11/27) contact them to discuss the prescription. Duration of antibiotic treatment was rarely a reason for calling the prescriber.

When they feel it is necessary to contact the GP, some CPs (11/27) expressed having difficulty in reaching the prescriber at the right time, i.e. when the patient is waiting for his/her treatment in the pharmacy. Indeed, these CPs explained that, as the opening hours of the pharmacy correspond to GPs' consultation hours, physicians are often not available to answer the phone.

Another difficulty encountered by most CPs (22/27) is poor communication with prescribers. CPs feel that they are not always listened to by GPs, and sometimes even badly received. If the prescriber maintains his/her position concerning the prescription, some CPs (11/27) deliver the antibiotic without informing the patients of their doubts. Fewer CPs (7/27) involve the patients in the decision of delivering the treatment or not: they refer to guidelines or to specialized physicians' practices, explain to patients both points of view and let them make the choice.

However, some CPs (5/27) mentioned emergent collaborations between GPs and pharmacists to discuss difficult cases, and that they experience an easier dialogue with younger GPs. Most CPs (17/27) made practical suggestions to make communication between CPs and prescribers easier to improve ABS, such as: (i) using a secured instant messaging system with time slots during which physicians would reply (10/17); (ii) having access to the electronic patient medical record (e.g. clinical data, biological results, prescription history) to optimize the order analysis and thus to avoid disturbing the prescriber whenever possible (7/17); (iii) setting up multidisciplinary meetings to discuss patients' therapeutic

Table 2. Selection of the most illustrative verbatims regarding participants' views on antibiotic stewardship and antibiotic use/misuse

Subtheme	Interview	Verbatim
Antibiotic stewardship	I1	'The right antibiotic for the right condition, for the right amount of time, for the right purpose'
Prescribers' antibiotic use/misuse	I18	'You call the general practitioner and tell him/her "I have done the test, it's viral", he'll tell you "I know my patient. If I don't give him/her antibiotics, I'll see him/her again in three days, s/he'll be superinfected."'
	I21	'I have a person [paediatrician] in front of me who tells me that s/he doesn't believe in these guidelines and that her/his extensive experience as a paediatrician gives her/his practices that are out of the guidelines.'
Patients' antibiotic use/misuse	I6	'[. . .] and patients also ask for them [antibiotics], some patients start treatment at home with leftover tablets, and then there are requests for antibiotics, particularly for urinary tract infections.'

Table 3. Selection of the most illustrative verbatims regarding participants' views on their current role and practices

Subtheme	Interview	Verbatim
Role	I20	'We need to have more [responsibilities] with the change that's coming if we don't want our role to be reduced to a simple seller of drugs and for the patient to be able to identify us as a true healthcare professional'
Counselling patients	I14	'I have three words: recommendations, compliance, and associated advice [. . .] there is more but the most important is this'
Prescription analysis and validation	I8	'Except contacting the GP if you are facing a contraindication or drug interaction, you don't take the risk otherwise you get scolded because the GP has decided to prescribe it'
	I23	'We check the prescribed dose in relation to the pathology, then there is the duration. . . Unfortunately, we do not check with duration, which is often inadequate. We stop there'
	I17	'I don't do anything, because anyway the physician is going to be offended and we're not there to call him/her and disturb him/her, especially as the pharmacist is below the [medical] doctors'
	I15	'I have been insulted by a GP: "I prescribe, you deliver", a prescription means "to order"'

management and share opinions (6/17); and (iv) integrating pharmacies into multidisciplinary medical practices (4/17), as geographical proximity allows a closer collaboration between healthcare professionals. Finally, 'in an ideal world', some CPs (5/17) imagined that physicians would be responsible for the diagnostic process and, when a drug is needed, pharmacists would be responsible for prescribing (including the choice of the molecule and the duration of treatment) and drug dispensing as, according to them, is the case in some Canadian areas.³⁷

CPs' potential future missions (Table 4)

Prescription modification

Regarding the new ABS activities they would like to perform, many participants (14/27) mentioned prescription modification, defined as the possibility to: (i) change (if needed) an empirical antibiotic treatment after receiving the results of the antibiotic susceptibility

testing (8/14); (ii) adapt the dosage and/or the molecule according to the patient's characteristics (5/14) (e.g. comorbidity, contraindication, allergy or renal insufficiency) without calling the prescriber for approval but informing him/her of the change; (iii) modify treatment duration to comply with guidelines (5/14); (iv) deliver a narrower-spectrum antibiotic than the one prescribed (3/14); and (v) unless contraindicated, switch to a first-line antibiotic (according to guidelines) if it has not been considered by the prescriber (3/14).

Initiating the antibiotic prescription

Most participants (22/27) mentioned the initiation of the antibiotic prescription, perceived to be the topical subject. Some of them (8/22), the most experienced ones (≥ 20 years of practice), were in favour of pharmacists being authorized to prescribe antibiotics, but only in very specific situations: for uncomplicated infections

Table 4. Selection of the most illustrative verbatims regarding participants' opinions on their potential increased involvement in ABS in the future

Subtheme	Interview	Verbatim
Prescription changing	19	'The GP prescribes an empirical antibiotic treatment and then we have access to the result of the antibiotic susceptibility testing. Being able to correct it seems possible to me for the moment there is really no need to go back to the doctor'
	11	'A lot of prescriptions of antibiotics that are not the first line antibiotics [recommended], so I see myself intervening at this level, so yes change of molecule is possible'
Initiating prescription	11	'No, it's no longer pharmacy but medicine, prescribing within a very specific framework like in urinary tract infection or sore throat yes but not the rest'
	I18	'By allowing this, we open the door to misuse and resistance, if we are allowed to give amoxicillin it will banalize its use'
Point-of-care testing	I14	'They never, or rarely do [the antibiotic susceptibility testing (AST)], they, say "oh it's ok, I have the medication here". [...] Ideally, it would be a rapid diagnostic test [...] And then we discuss with the GP and say "well, the antibiotic susceptibility testing says that, what do we do?"'
	I16	'It takes time and patients are waiting and they wouldn't necessarily understand. The issue is also that there is no privacy [to conduct the test] at all and that's a problem, we can't do that at the counter'
Delivering the exact number of pills	I26	'We didn't do 6 years of study to cut blister packs'
	11	'Doctors should already prescribe the right duration and the right dosage, because the packaging is made so that if the duration is not respected more boxes will be delivered'
	I15	'There is no need to deliver the exact number of pills, it is necessary to have the right number of pills per package according to the indications and we should also be allowed to give only for 7 days if it is written for 8 days and the packages are made for 7 days'
Unused antibiotic disposal	I19	'Often they bring us the packages of other treatments because they know that we take them back but it is true that I never thought of giving them this kind of information'

[urinary tract infection (UTI), conjunctivitis and sore throat], after a POCT if available and in case of predefined emergencies (e.g. UTI in women) when a consultation with a GP is impossible. Other participants (14/22) were against the initiation of the prescription by CPs because of (i) the risk of delaying or masking another diagnosis; (ii) the risk of antibiotics becoming trivial if they are available without a prescription by a physician; (iii) the risk of fraud and excessive prescriptions, as the pharmacists' income depends on the quantity of drugs dispensed; and (iv) the risk for some patients to go from pharmacy to pharmacy to get antibiotics.

Point-of-care testing

Most participants (19/27) mentioned POCT, which they perceived as a means to improve patients' care and avoid unnecessary prescriptions of antibiotics. All of them (19/19) wished to do more sore throat tests to avoid medical consultations for viral infections: if the test is positive, the pharmacist refers the patient to the GP; otherwise, the patient is not encouraged to see the GP and a symptomatic treatment is recommended by the CP. Some participants (6/19) also mentioned the creation of rapid diagnostic testing for UTI, more specific than a urine dipstick. Such a test (when negative) would avoid the inappropriate delivery of an antibiotic under patient pressure while waiting for the results of a urine culture.

Some participants identified several barriers to using POCT: (i) they fear that authorization for them to perform POCT would make the GP-pharmacist collaboration even more difficult (8/19); and (ii) the question of the responsibility in withholding antibiotics in case of false negatives (4/19).

Unit dose delivery of antibiotics

Almost all participants (23/27) mentioned the unit dose delivery of antibiotics, which would allow the pharmacist to deliver the exact number of pills according to the prescription. They considered it unnecessary (17/23), ineffective to prevent self-medication and difficult to implement (e.g. not adapted for oral suspensions, commonly used for children). Some CPs (7/23) also argued that the time spent to repackage, print leaflets for each patient and ensure traceability will be more costly for the National Health Insurance than to compensate them for the time spent delivering antibiotic packages. Many CPs (14/27) mentioned alternative solutions to unit dose delivery: (i) the harmonization of prescribing practices (i.e. for a given indication, all physicians would prescribe the same dosage and duration for all patients) and the adaptation of the number of pills per package by pharmaceutical industry to avoid leftovers (7/14); and (ii) the ability for the CP to adapt the treatment duration to deliver a number of antibiotic packages that prevents patients from having leftovers (5/14).

Unused antibiotics' disposal

Many participants (10/27) mentioned disposal of unused antibiotics as an important tool for improving ABS. While many CPs currently fail to remind the patient to return unused antibiotics when delivering them, they were aware that this could improve ABS and reduce self-medication. They were willing to encourage more patients to do it.

Discussion

Most interviewed CPs had a clear understanding of ABS and were aware of antibiotic resistance. They considered themselves as ‘guardians of the appropriate use of drugs’ but often failed to fulfil this mission due to difficult relationships with GPs. To date, their main involvement in ABS has included (i) counselling patients about the antibiotic treatment and (ii) reporting to the prescriber when they identify contraindications or drug interactions. Concerning their wish to increase their ABS involvement, CPs felt they could use more rapid diagnostic testing for sore throat, but they were divided on the possibility of them to changing the medical prescription of antibiotics, and most were against the possibility of initiating an antibiotic prescription. Unit dose delivery was not perceived well by CPs.

Unlike previous studies,^{21–23} our results show that French CPs had a good knowledge of ABS. Barriers identified in the literature to implement ABS by CPs were: time available, no access to clinical data (especially the diagnosis), reimbursement models and relationships with other healthcare professionals.^{26,27} This last factor was also found and particularly emphasized in our study. If patients’ education, self-care advice, unit dose delivery and screening guideline compliance of antibiotic prescriptions were cited as CPs’ activities in previous studies,^{22,23,27} rapid diagnostic testing and CPs’ antibiotic prescriptions were not mentioned. However, non-legal antibiotic delivery was observed in low-income countries.^{21,24} None of the previous studies explored CPs’ perceptions about the evolution of their missions toward ABS. It should be noted that CPs in several countries are allowed to initiate an antibiotic treatment. For example, in the USA, CPs engaged in collaboration practice agreements with GPs can use POCT for sore throat and flu, and then initiate an antibiotic or an antiviral treatment if necessary.¹⁶ In the UK, CPs can initiate a treatment with azithromycin for a patient and his/her partners who test positive for *Chlamydia trachomatis*. In New Zealand, CPs who have completed specific training can initiate a short-term treatment with trimethoprim for an uncomplicated UTI.³⁸ In some Canadian regions, CPs can initiate antibiotics for some defined diseases and adapt and manage the medical prescription by changing the molecule, the dosage or the formulation.³⁷ Recently (in March 2020), and after our study was conducted, permission was given for French CPs engaged in a cooperation protocol with GPs to initiate antibiotic treatment for some situations: sore throat (after rapid diagnostic testing)³⁹ and UTI (after a review of eligible criteria and a urine dipstick).⁴⁰ Through dedicated software, CPs may have access to the GPs’ electronic record of patients with an uncomplicated UTI or a sore throat within the framework of a cooperation protocol.

Unit dose delivery of antibiotics is routine practice in several countries (e.g. The Netherlands, USA, UK, Czech Republic).¹⁹ In France, unit dose delivery of 14 antibiotics was trialled by 75 pharmacies in 2014–15 in a randomized controlled study, and showed a 10% reduction in the number of pills delivered. Moreover, it was well accepted by patients and improved their compliance with treatment.⁴¹ Unit dose delivery will be implemented for certain drugs in France in 2022, but the exact list of drugs that will be targeted has not been published yet.⁴² Our study shows that efforts should be made in order to improve CPs’ acceptability of this measure.

Besides discussing potential new activities, participants also expressed a wish to build on their current missions, such as patient education/counselling. Participants also acknowledged the importance of unused drug disposal, and CPs could give patients some leaflets that have been developed by Cyclamed® and relayed by the French College of Pharmacists.⁴³ The return of unused antibiotics could reduce patients’ self-medication or sharing as well as the selection of antibiotic-resistant bacteria caused by antibiotics discarded in household waste bins or in sinks.^{44,45}

Antibiotic resistance is a global threat that requires the involvement of all healthcare professionals, not only prescribers, but also other professionals such as pharmacists, nurses or microbiologists. Thinking about the roles and missions of each professional and the way to improve collaboration between them in the field of infection management is essential. Based on a systematic review, Saha et al.²⁷ identified ways to improve ABS in community pharmacies, at various levels: personal (e.g. professional training), interpersonal (e.g. local GP–pharmacy practice agreement), community/policy (e.g. patient education campaigns), health system structure (e.g. decision support tools) and financial (e.g. remuneration for CPs involved in ABS programmes). Our study highlights the need to act at the interpersonal level and to achieve an optimal collaboration between healthcare professionals. Ways to facilitate discussion and teamwork and to promote trust between professionals may include regular GP–CP group meetings, practice agreements and greater interactions during initial and continuing training.^{46,47}

The qualitative approach used in this study fit our objective: the semi-structured interviews allowed an in-depth exploration of pharmacists’ perceptions and desire for professional development and also of the barriers that prevent them from achieving their goals. Besides, we randomly selected participants among all CPs located in two French regional areas, and the final sample included a diversity of profiles regarding experience and pharmacy location. However, we cannot exclude a possible selection bias as CPs who agreed to participate in interviews were probably more knowledgeable and interested in ABS than those who declined.

Conclusions

CPs who participated in this study had a clear understanding of ABS and were willing to be more involved in ABS activities. They were particularly in favour of doing more rapid diagnostic testing for sore throat and systematically reminding patients to bring back their unused antibiotics. To increase pharmacists’ involvement in ABS there is however a critical need to improve collaboration and trust between pharmacists and physicians.

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Transparency declarations

None to declare.

Author contributions

N.T., C.P., C.W., J.G. and B.D. conceived the project. A.E., N.T., C.P., C.W. and J.G. developed the interview guide. A.E. and A.P. collected the data, elaborated the analysis grid and coded the interviews. A.E., A.P. and A.B. interpreted the results. A.E. and A.B. drafted the first version of the manuscript, which was reviewed by all authors.

Supplementary data

Table S1 and Appendices S1 and S2 are available as [Supplementary data](#) at JAC-AMR Online.

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