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Preventing and managing urinary tract infections: Enhancing the role of community pharmacists – a mixed methods study

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ABSTRACT (264 words)

Background:

Community pharmacists are involved in antimicrobial stewardship through self-care advice and delivering medications for uncomplicated infections.

Objectives

This mixed methods study aimed to identify opportunities to enhance the role of community pharmacists in the management of patients with suspected or confirmed urinary tract infection (UTI).

Methods

Data collection was through a service user survey (n=51) and pharmacist surveys and semi-structured interviews before (16 interviews, 22 questionnaires) and after (15 interviews, 16 questionnaires) trialling UTI leaflets designed to be shared with patients. Data were analysed inductively using thematic analysis and descriptive tabulation of quantitative data.

Results

Twenty-five percent (n=13/51) of service users with urinary symptoms sought help from a pharmacist first and 65% (n=33/51) were comfortable discussing their urinary symptoms with a pharmacist in a private space. Community pharmacists were confident as the first professional contact for service users with uncomplicated UTI (n=13/16, 81%), but indicated the lack of a specific patient referral pathway (n=16/16, 100%), the need for additional funding and staff (n=10/16, 62%), and the importance of developing prescription options for pharmacists (5/16, 31%). All community pharmacists reported playing a daily role in controlling antimicrobial resistance by educating service users about viral and bacterial infections and promoting a healthy lifestyle. Enhancing their role will need greater integrated working with general practices and more prescribers based in community pharmacy.

Conclusion

This study suggests that community pharmacists could play a greater role in the management of uncomplicated UTI. The current reconfiguration of primary care in England with primary care networks and integrated care systems could provide a real opportunity for this collaborative working with potential learning for international initiatives.

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MANUSCRIPT

INTRODUCTION

Urinary tract infections (UTIs) are the most commonly seen bacterial infection in general practice: up to 50% of women will have a UTI in their lifetime and 30% will have recurring episodes.[1] UTIs account for as much as 15-20% of the antibiotics prescribed in primary care.[2] Outcomes are usually very good as most cases resolve in 3-4 days with empirical antibiotics,[3] but as many as 60% of these women may not have a positive urine culture.[4] In contrast one-fifth of community-acquired bacteraemia in patients admitted to an English National Health Service (NHS) Trust in 2007–08 were UTI associated. In a recent study, 95% of women consulted a health professional for their most recent UTI: 74% reported being prescribed an antibiotic, yet only two-thirds reported taking them, highlighting the need for better advice about antibiotics in the community.[5]

Community pharmacists are involved daily in antimicrobial stewardship (AMS) by providing service users with self-care advice, delivering medications and recommending over-the-counter treatments for common infections. The UK 2019 5-year antimicrobial resistance (AMR) action plan states that primary care pharmacists have a critical role in reviewing prescriptions for antimicrobials and challenging those that may be inappropriate.[6] National and local campaigns advise the general public to first contact their pharmacist for healthcare advice.[5] Community-based interventions with pharmacists have the potential to control the rise of bacteraemia and to improve antimicrobial use for UTIs by increasing patient knowledge and self-care skills. By enhancing self-care, preventative measures and appropriate referral to General Practitioners (GPs), these measures could improve the health and wellbeing of the general public. This is particularly relevant as virtually all service users with suspected or confirmed UTI visit a community pharmacy either before their general practice or after to collect a prescription. However, few guidelines have been developed to guide pharmacists in the community management of suspected or confirmed UTI. The UK national action plan (NAP) for AMR indicates a need to strengthen the links between primary care pharmacists and GP practices,[6] but further research is required to investigate the best measures to empower pharmacists in an antibiotic stewardship role.

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This study aimed to explore the views of pharmacy staff on giving advice for women and older adults with suspected or confirmed UTIs while assessing the feasibility and acceptability of the Public Health England (PHE) TARGET UTI patient information leaflets[9] in the community pharmacy setting. The objective of this mixed methods study was to identify opportunities to enhance the role of community pharmacists specifically in the management of UTI by exploring the journey of service users with urinary symptoms.

METHODS

The TARGET UTI leaflets

The TARGET UTI leaflets are designed to be shared with patients and aim to facilitate communication between healthcare professional and patient, and increase patient's confidence to self-care.[10] The leaflets follow relevant National Institute for Health and Care Excellence (NICE) guidelines.

Study design

This study used mixed methods to explore the views of pharmacists, and service users with suspected or confirmed UTI.

Questionnaires and interviews schedules

Two semi-structured questionnaires, and interview schedules to explore the role of pharmacists in the prevention of management of UTIs (before and after trialling the leaflets) and one semi-structured questionnaire to analyse the opinion of service users were developed by a multidisciplinary team of clinicians and researchers at Imperial College London and PHE (Supplementary material). The questionnaires were theoretically informed by the Consolidated Framework for Implementation Research to understand individual level and contextual influencing factors to adoption of the leaflet.[11] The questionnaires were reviewed and tested by two community-based pharmacists and were refined according to comments. The pharmacist questionnaires collected information about demographics, characteristics of the pharmacies, particularities of giving advice in the pharmacy setting generally and specifically about the UTI patient journey, using closed and open-ended questions. The questionnaire

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for service users collected information about demographics, the literacy, the patient experience of their suspected UTI, its management, self-care and resolution. This was piloted with a patient representative and subsequently revised.

Study setting: community pharmacies in Newham

We included community pharmacies in one London borough (Newham), purposively sampled, which would enable views from patients of different socio-economic status. An invitation, including an information leaflet and consent form, was sent by the LPC lead pharmacist to 26 pharmacies in April 2019; researchers sent non-responders a reminder 2 weeks later.

Participant enrolment

Pharmacists agreed to participate in a phone interview and complete an electronic questionnaire before trialling the TARGET UTI leaflets for 3 months in their pharmacy. At the end of the 3 months the pharmacists participated in a second interview and completed a further questionnaire. The pharmacists were provided with a £30 voucher incentive after each interview.

Service users who received the TARGET UTI leaflet at the pharmacy were invited in person when they were given the leaflet to complete a paper or electronic survey at home. The paper survey with a written consent form was attached to the leaflet in a prepaid envelope and the electronic survey was accessible via the use of a QR code or a weblink. Service users were provided a £10 voucher incentive if they completed the survey electronically or sent it by mail.

Data analysis

The interviews were recorded, anonymised and transcribed *verbatim* by a professional company and checked against the interviews by a researcher. Interviews were analysed by a researcher using an inductive thematic analysis.[12] Two other authors each independently inductively coded 3 different transcripts. The three researchers collectively reviewed and reached a consensus about the application of themes through independent coding and group discussion, which were then reviewed and agreed by the research team. The interviews were then coded according to the themes using the NVivo 12 software. Data from the closed-ended questions of the surveys were imported into R software (version 3.2.4). Numerical data are presented as absolute numbers, proportion, median ±

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interquartile range (IQR). We used Pearson's chi-squared test to compare the results among service users.

Ethics

The study received approval from Imperial College London and ethics committee [Imperial College Research Ethics Committee reference: 18IC4777]. Data management was compliant with the European General Data Protection Regulation.

RESULTS

Participants: pharmacist and service users

Among the 26 pharmacies contacted in Newham, 20 (77%) participated in the pre-intervention assessment and 16 (62%) in the 3-month trial of the leaflets and the post-intervention assessment. We conducted 16 interviews and collected 22 questionnaires before and 15 interviews and 16 questionnaires after trialling the leaflet (Figure 1). The pharmacists comprised 8 women and 14 men, with a median of 15 years (IQR, 5-30) post qualification experience (Table 1). Fifty-one service users participated in the survey, majority of which were female; 43 (84%). Twenty-one participants (41%) had recurrent UTIs, 23 (45%) had had one or two UTIs before and 6 (12%) had a UTI for the first time.

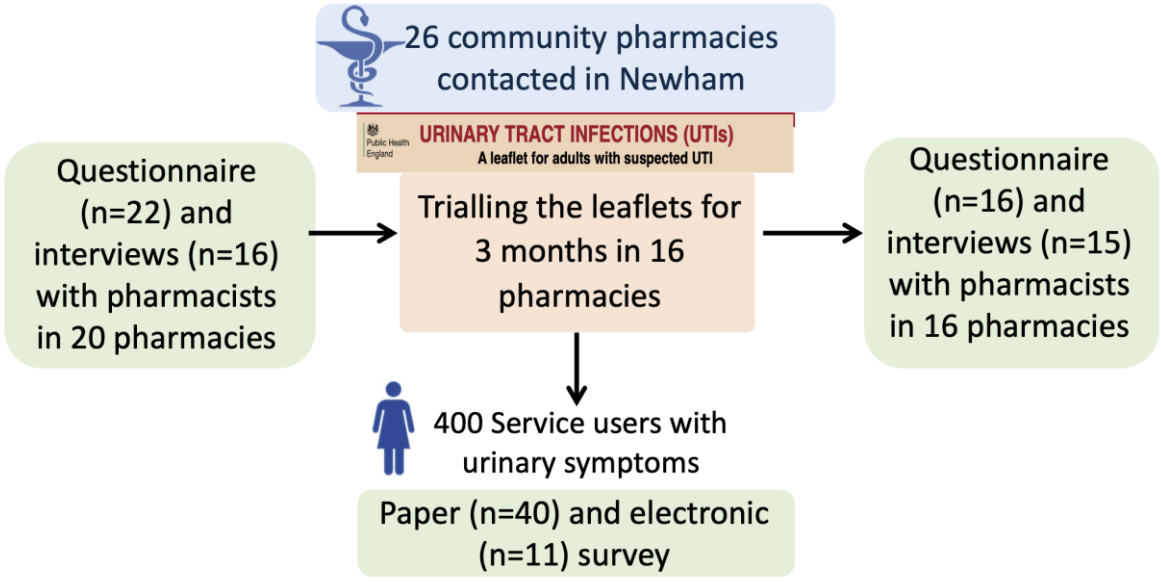

Figure 1: Design of the study

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Table 1: Characteristics of the participants

Pharmacists		**n (%) or median [IQR] (n=22)**
Women		8 (36)
Job description		
	Non-prescribing pharmacists	18 (82)
	Prescribing pharmacist	3 (14)
	Pharmacy technician	1 (4)
Years since qualification		15 [5-30]
Years in the pharmacy		9.5 [5-17]
Pharmacy staff (full time equivalent) in the pharmacy		4 [3-5]
Service users per day		55 [40-100]
Estimated percentage of male service users seen in the pharmacy		61 [52-62]
Service users seen in the consultation room per day		8 [5-12]
Estimated number of service users given healthcare advice		20 [16-37]
Service users		**n (%) (n=51)**
Women		43 (84)
Age		
	Children	1 (2) (completed by the mother)
	18-24	8 (16)
	25-34	10 (20)
	35-44	4 (8)
	45-54	11 (22)
	55-64	7 (14)
	65-74	4 (8)
	>75	4 (8)
Ethnicity		
	White	27 (53)
	Asian	14 (27)

Peer-reviewed version available at *Antibiotics* **2020**, *9*, 583; doi:10.3390/antibiotics9090583

	Black	4 (8)
	Mixed	4 (8)
UTI history		
	Recurrent UTIs	21 (41)
	One or two before	23 (45)
	First time	6 (12)

Survey results: The patient UTI journey in the community

Before seeing a healthcare professional, 15/51 (29%) service users reported consulting their family for information on urinary symptoms and 9/51 (18%) reported consulting online sources (e.g. NHS choices). Younger participants (aged 18–34 years versus those aged over 34 years) were more likely to access information about UTI on the internet (50% versus 18%) (p=0.01). Two-thirds (n=31, 62%) of the service users reported drinking more fluids before going to the pharmacy or visiting their GP, but 20 (39%) did not. Some service users reported taking painkillers (n= 15, 29%), cranberry juice or capsules (n=12, 24%), resting (n=10, 20%), taking cystitis sachets (n=8, 16%), nonsteroidal anti-inflammatory drugs (n=7, 14%), or time off work (n=2, 4%). Thirty-seven service users (72%) went to a pharmacy following a GP visit after being prescribed an antibiotic and 13 (25%) went to a pharmacy before seeking advice from another health professional (Figure 2). The results from the pharmacists' questionnaires confirmed this finding stating that, on average, 71% of service users came to the pharmacy following a GP visit with an antibiotic prescription and 29% visited the pharmacy first for advice and over the counter medication. Service users rarely reported (n=2, 4%) going to the pharmacy following a GP visit when antibiotics had not been prescribed.

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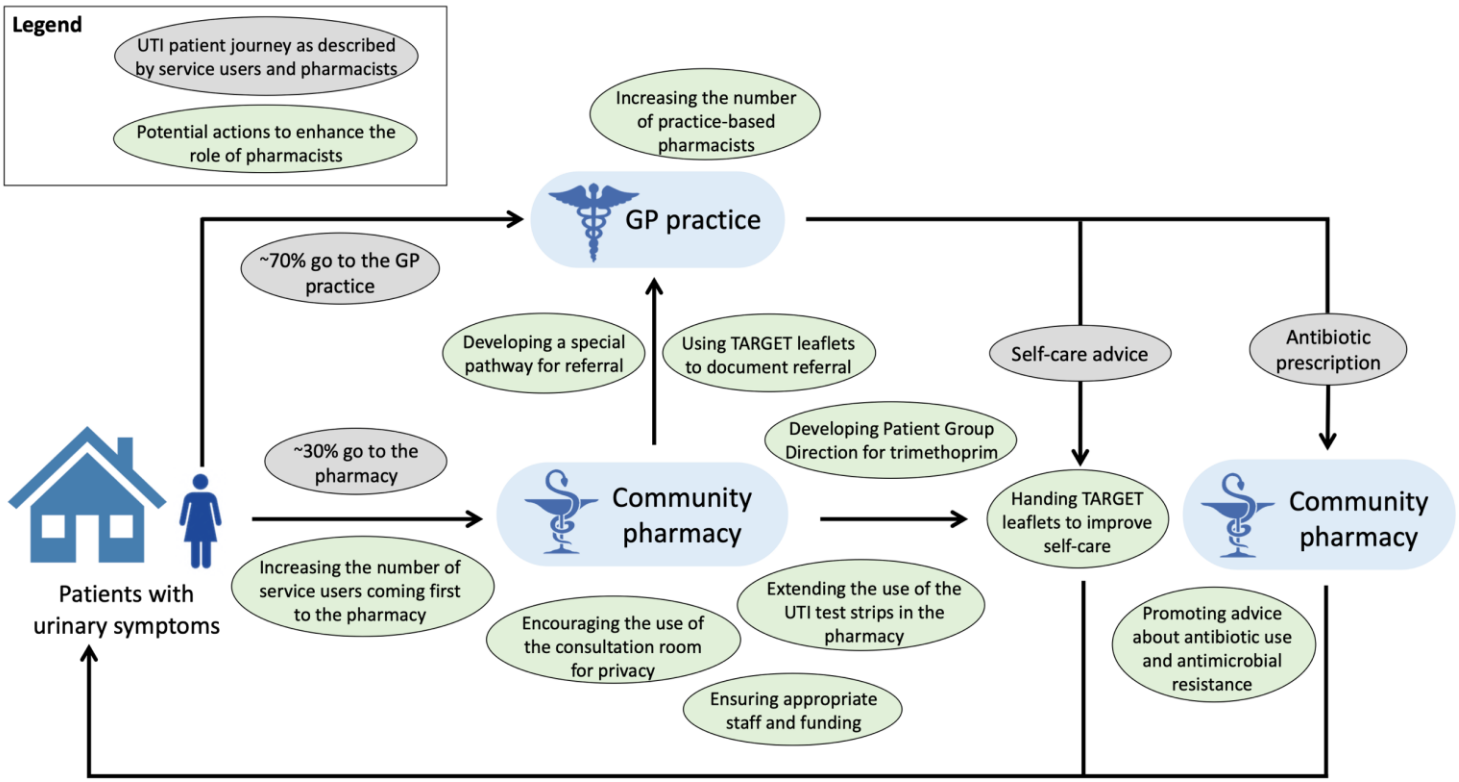

Figure 2: Potential actions to enhance the role of community pharmacists in the management of service users with suspected or confirmed urinary tract infection

Advice in the pharmacy

During interviews, pharmacists identified barriers and facilitators to giving healthcare advice in the pharmacy setting compared with a GP practice (Table 2). The most cited barriers were the lack of staff or time (n=17, 77%), the language barrier (n=13, 59%) and the absence of access to patient medical records (n=9, 41%). On the contrary, facilitators were that pharmacists are trained and confident in giving advice (n=22, 100%), that no appointment is needed (n=17, 77%) and that pharmacies have long opening hours (n=14, 64%). The language barrier was mitigated by the number of languages spoken by the pharmacists and their staff: we discussed this point with 6 pharmacists who all reported the fluent use of 4 to 6 Asian languages in their pharmacy in addition to English.

Service users were mostly (n=33, 65%) comfortable discussing their urinary symptoms with a pharmacist as long as it was confidential and in private. As expected, the majority of service users

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(n=36, 70%) did not want to discuss urinary symptoms at the counter if they could be overheard by other customers.

Table 2: Barriers and facilitators of giving advice in the pharmacy raised during interviews

		Pharmacists n=22 (%)
Barriers		
	Lack of time or staff	17 (77)
	Language barrier	13 (59)
	No access to the medical record	9 (41)
	Not recognised or funded by health authorities	5 (23)
	No possibilities to prescribe medication	5 (23)
	Outside the scope of expertise of pharmacists	3 (14)
	Waiting time is unpredictable for service users	2 (9)
	Some service users prefer information from doctors	2 (9)
Facilitators		
	Pharmacists are confident and trained in giving advice	22 (100)
	No appointment needed	17 (77)
	Long opening hours	14 (64)
	Ease of access	13 (59)
	Multiple languages spoken by the staff	12 (55)
	Financial incentive to give additional advice	10 (45)
	Availability and use of a consultation room	9 (41)
	Close contact with the service users	8 (36)
	Flexible time for consultation (no time limit)	6 (27)
	Counter assistants and sufficient staff	5 (23)
	Local presence / community-based	2 (9)
	Possibility to give advice on the phone	2 (9)

When asked via questionnaires about the most important self-care advice given to service users with suspected UTI, all the pharmacists (n=22) recommended drinking plenty of fluids and taking over-the-

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counter products (e.g. cystitis sachets), 64% (n=14) recommended painkillers, 36% (n=8) discussed red flags to visit the GP and 27% (n=6) gave preventative advice. All pharmacists interviewed agreed that it was difficult to give comprehensive self-care advice because of the lack of time. Overall, the pharmacists were confident in discussing UTIs with service users.

Communication with the GP

During pharmacists interviews we explored the reasons for referral to the GP (Figure 2). The pharmacists referred all male patients, pregnant women, older people (over 65-years old) or children (below 16-years old), patients with symptoms lasting for more than 48 hours, with lower abdominal pain or kidney pain, with temperature, blood in the urine or severe comorbidities, and those presenting with recurrent UTIs to the GP. However, pharmacists could only instruct patients to visit their GP and as such, they stressed the need to develop a special referral pathway between pharmacies and GPs (n=16, 100%). They suggested that the TARGET UTI leaflets could be used as a referral notice between healthcare professionals:

"*So, there's not much, much of a connection between the two settings. For example, if there was a patient that we were particularly concerned about, we can't call up the GP practice and say, oh, could you give them early appointment because I've seen them and I've noticed X, Y, Z. There's not that rapport yet or there's not that importance* [placed in] *a pharmacist's view, I feel, in community*." P4.

The role of pharmacists

Table 3 presents the themes and sub-themes that were generated from the qualitative analysis of the interviews with the pharmacists regarding the management of service users with suspected or confirmed UTI. Most pharmacists interviewed (n=13, 81%) suggested that pharmacists could act as a first-line triage for service users with UTIs:

"I don't think [the service users] need to go directly to the GP because mostly UTIs could be self-limiting" P1.

The pharmacists reported that if they were the first healthcare professional to give advice to service users with suspected or confirmed UTI this could relieve pressure on other NHS services, including GPs. However, they requested additional funding for staff to give advice for those with suspected UTI as pharmacies are not currently funded for this:

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"Yeah, but you see having a role to play is one thing but you need to be remunerated for that role. You can't expect pharmacists to do everything for nothing" P13.

Increasing the Patient Group Directions (PGD) to prescribe first-line treatments for uncomplicated UTIs could help enhance this role:

"[Having a UTI PGD] …*could be something which might take a bit of work off the GPs. And in that service, we do get a consultation fee as well and we do that service for Pharmacy First or the Minor Ailment. So, I think that's some revenue, it works for the GP and it works for the patient*" P3.

All the pharmacists interviewed (n=16, 100%) agreed that they had a major role in the control of AMR by educating service users about antibiotics and infections for which antibiotics are not needed. They reported giving daily self-care advice for viral infections and self-limiting UTIs, and triaging patients and advising when they should consult a GP. They also described having an important role in preventative measures in community care and participating in preventing bacterial infections by promoting a healthy lifestyle:

"*That is where it should all start. We* [pharmacy staff] *should be highly focused on prevention, and providing advice for people to self-care and self-manage, and improve their health. And that will stop, forget the resistance* [AMR], *you will not even need to prescribe antibiotics if people are living a healthy lifestyle. (…) So, the biggest impact the pharmacist can make is in the prevention agenda*" P10.

Table 3: Themes and sub-themes of the qualitative analysis of interviews on the role of pharmacists in the management of service users with suspected or confirmed urinary tract infection

Management of service users with suspected or confirmed urinary tract infection		n (%) (n=16)
	Pharmacists can act as a first-line triage	11 (69)
	They need funding or additional staff to do so	10 (62)
	They should have more possibilities to prescribe first line treatments (e.g. PGDs)	5 (31)
	They can give dipstick tests and check the results	1 (6)
Strengthening the link between pharmacists and GPs		
	Development of a special referral pathway between pharmacies and GPs	16 (100)
	Self-care advice relieves pressure on the NHS and the GPs	6 (37)

Peer-reviewed version available at *Antibiotics* **2020**, *9*, 583; doi:10.3390/antibiotics9090583

Reducing the spread of AMR		
	Education of service users about infections for which antibiotics are not always needed	16 (100)
	Screening patients who need to go to the GP	10 (62)
	Self-care advice for viral infections and benign bacterial infections	12 (75)
	Promotion of a healthy lifestyle	5 (31)

DISCUSSION

Summary

We explored the UTI patient journey with both pharmacists and patients to identify opportunities to enhance the role of community pharmacists specifically in the management of UTIs. The self-care management of service users with suspected UTI can still be improved as 38% of service users did not report drinking plenty of fluids before seeing a healthcare professional. One third of service users with suspected UTI sought help first from a pharmacy, but the majority visited to pick up their antibiotic prescription after a consultation elsewhere. Barriers to giving advice in the pharmacy were the lack of staff or time, the language barrier and the absence of access to patient medical records. Pharmacists were trained and confident to give advice to patients with suspected UTI but they pointed out the lack of a specific pathway to refer patients who need an antibiotic to GPs, and the need for additional funding and staff to enable an increased role of community pharmacies in the management of uncomplicated infections. Community pharmacists integrated their role to fight AMR into the wider context of healthcare education and promotion of a healthy lifestyle.

Comparison with existing literature

The proportion of service users with urinary symptoms coming first to a pharmacy (around 30%) is very close to what has been found in another study in which 36% of the patients presented directly in a pharmacy.[8] In a household survey conducted in 2014 in England only 13% of females who had ever

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had a UTI reported going first to a pharmacy; the rate in this study may have been lower as it included a wide age range of participants.[5] As described in recent studies, we have found support from both patients and pharmacists for increased access to UTI management and advice through community pharmacies.[8,13] This confirms the need for interventions targeting community pharmacies to improve the UTI patient journey including self-care advice and appropriate referral. According to our study and the literature, the development of a PGD for uncomplicated UTIs is supported by pharmacists in order to extend their management options.[8] A recent study found that a community pharmacy-led UTI test-and-treat service for women aged 16–64 years with urinary symptoms helped to support the appropriate use of antibiotics and reduced demand on other NHS resources such as GP surgeries.[13] However, there is a need to carefully consider the advantages of PGDs which should lead to more timely treatment of UTI with the potential drawback of increased use of antibiotics in UTI as has been found for chloramphenicol and eye infections.[14] The risk of overuse of antibiotics for suspected UTI leading to increased AMR could be mitigated with an increased pharmacy access to clear protocols, accurate point-of-care testing,[13] UTI culture, and shared patients records.[15] Sixty-two percent of the service users in our study took extra fluids before consulting a healthcare professional, as compared to 35% in a study in 2014 in the UK.[5] This might reflect the effect of recent interventions including online campaigns to promote self-care advice about UTIs in the community.[16,17]

The barriers to giving self-care advice about UTI in the community pharmacy setting confirm findings in a qualitative study with GPs, pharmacists, pharmacy staff and representatives from pharmacy organisations in England and Wales.[15] Clinicians reported that lack of time or staff and lack of access to medical information was perceived as a barrier to giving effective and thorough self-care advice. Overall, our results support increasing the collaboration between GPs and community pharmacists as advocated in a joint statement by the Royal College of General Practitioners (RCGP) and the Royal Pharmaceutical Society (RPS).[18] The proposals of this statement include many of the measures that have been asked for by pharmacists in our study such as a greater role for community pharmacy in managing minor self-limiting conditions, access to health records and better links between practice-based pharmacists (Clinical Pharmacists) and community pharmacy. This has also been highlighted in the community pharmacy 2019 to 2024 contractual framework that encourages the development of point-of-care testing in community pharmacies to support efforts to tackle AMR.[19]

Peer-reviewed version available at *Antibiotics* **2020**, *9*, 583; doi:10.3390/antibiotics9090583

Strengths and limitations

Acceptance rate by community pharmacies to participate was high, and we collected information both from pharmacists and service users' point of views, facilitating triangulation of data. Although patients from white ethnicity were over-represented in the user responses (53% in our sample versus 28% in the borough according to the 2019 GLA housing-led projection), our sample of service users did have participants representing the diversity of Newham borough. Participants age was similar to the local population as a whole. Service user questionnaire completion was quite low as only 13% of 400 questionnaires were returned. However, this return rate is quite usual in any service evaluation by the public and participation of the BAME (Black, Asian and Minority Ethnic) populations in research is known to be difficult.[20] The small sample size including 22 pharmacists and 51 patients as well as the risk of recruitment bias when recruiting pharmacists or service users motivated to participate in a study is recognised. However qualitative research aims to attain a range of views rather than necessarily obtaining views representative of the general population. Interviewing GPs may also have provided a more comprehensive scope and additional review regarding the role and value of community pharmacists in antimicrobial stewardship for UTIs, but this has already been attained in other qualitative studies.[10,15]

Implications for practice

Prescription options for pharmacists, levels of funding and incentives are areas to explore in policy and contractual developments. Developing a referral pathway is a way to strengthen the link between pharmacists and GPs and to give more importance to the place of pharmacists in the community setting. The referral of patients from pharmacy to GPs could be improved through the use of the TARGET UTI leaflets that highlight the management of patients with suspected UTI.[22] Our results also provide evidence for the deployment of Clinical Pharmacists working in GP surgeries as they can represent a key link to community pharmacists[6] as part of the UK NHS Long term Plan for better integration of care.[23] Primary care networks (PCN) link the local community and community-based health and social care providers, including pharmacy, with constituent GP practices at its core.[24] PCNs

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intend to make greater use of community pharmacists' skills and opportunities to engage service users for integrated out-of-hospital care for patients. These results could inform the writing of guidelines for the management of service users with suspected or confirmed UTI in community pharmacies and inspire future strategies and interventions in the community.

CONCLUSION

We identified opportunities and potential interventions to improve the management of service users with suspected or confirmed UTI in community pharmacies. The current reconfiguration of primary care in England with primary care networks and integrated care systems could provide a real opportunity for this collaborative working with potential learning for international initiatives.

AUTHORS CONTRIBUTION

Conceptualization, N.P-S., R.A., L.J., A.H., D.L., R.Ah., C.M.;

Methodology, N.P-S., D.L., R.Ah., C.M.;

Validation, R.Ah., C.M.;

Formal Analysis, N.P-S., R.A., D.L., R.Ah., C.M.;

Investigation, N.P-S., P.P., R.Ah.,

Data Curation, N.P-S., R.Ah.,

Writing – Original Draft Preparation, N.P-S., R.Ah.,

Writing – Review & Editing, R.A.; L.J., R.Ah., C.M.;

Supervision, R.Ah., C.M.;

Project Administration, N.P-S., P.P, D.L., R.Ah.,

Funding Acquisition, A.H., R.Ah., C.M.;

FIGURE CAPTIONS

Figure 1: Design of the study

Peer-reviewed version available at *Antibiotics* **2020**, *9*, 583; doi:10.3390/antibiotics9090583

Figure 2: Potential actions to enhance the role of community pharmacists in the management of service users with suspected or confirmed urinary tract infection

GRAPHICAL ABSTRACT

Figure 2 is proposed as a graphical abstract.

CONFLICTS OF INTEREST

Leah Jones, Rosie Allison, Donna Lecky and Cliodna McNulty all work on Public Health England's TARGET Antibiotics Toolkit programme of work, developing and evaluating leaflets.
All other authors: No potential conflicts of interest.

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SUPPLEMENTARY MATERIAL

1. Pre-intervention interview schedule with pharmacists

2. Post-intervention interview schedule with pharmacists

3. Pre-intervention questionnaire for pharmacists

4. Post-intervention questionnaire for pharmacists

5. Questionnaire for service users

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