BMJ Open

Sexual and reproductive health services provided by community pharmacists: a scoping review

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To cite: Navarrete J, Yuksel N, Schindel TJ, *et al*. Sexual and reproductive health services provided by community pharmacists: a scoping review. *BMJ Open* 2021;**11**:e047034. doi:10.1136/bmjopen-2020-047034

► Prepublication history and additional online supplemental material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2020-047034).

Received 16 November 2020
Accepted 06 July 2021

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ABSTRACT

Objectives Pharmacists are increasingly providing patient-focused services in community pharmacies, including in the area of sexual and reproductive health (SRH). Specific SRH areas have been the focus of research, but a broader perspective is needed to position pharmacists as SRH providers. This review explored research that described and evaluated professional pharmacy services across a broad range of SRH areas.

Design Scoping review

Data sources Medline, EMBASE, CINAHL, Web of Science, Scopus and Cochrane Library (January 2007–July 2020).

Study selection Studies reporting on the description and evaluation of professional pharmacy SRH services provided by community pharmacists.

Data extraction Two investigators screened studies for eligibility, and one investigator extracted the data. Data were analysed to primarily describe professional pharmacy services and intervention outcomes.

Results Forty-one studies were included. The main SRH areas and professional pharmacy services reported were sexually transmitted and bloodborne infections (63%) and screening (39%), respectively. Findings showed that pharmacists' delivery of SRH services was feasible, able to reach vulnerable and high-risk groups, and interventions were highly accepted and valued by users. However, integration into daily workflow, pharmacist remuneration, cost and reimbursement for patients, and policy regulations were some of the barriers identified to implementing SRH services. Studies were primarily in specific areas such as chlamydia screening or hormonal contraception prescribing, while studies in other areas (ie, medical abortion provision, long-acting reversible contraception prescribing and vaccine delivery in pregnant women) were lacking.

Conclusion This scoping review highlights the expansion of pharmacists' roles beyond traditional product-focused services in a number of SRH areas. Given the potential feasibility, users' acceptability and reach, pharmacists are ideally situated to enhance SRH care access. Future research describing implementation and evaluation of professional pharmacy services in all SRH areas is needed to promote access to these services through community pharmacies and position pharmacists as SRH providers worldwide.

Strengths and limitations of this study

- This is the first scoping review to systematically identify and synthesise research that described and evaluated professional pharmacy services across a broad range of sexual and reproductive health (SRH) areas.
- A broad and comprehensive search strategy was conducted in six peer-reviewed databases.
- This review may help to guide the implementation of SRH services and inform new policies in high-income countries where pharmacists' scope of practice is expanding.
- We summarised challenges and barriers associated with provision of professional pharmacy services in SRH for studies that met our inclusion criteria; however, this review may not include all the barriers reported in the literature.
- A critical appraisal of the literature was undertaken to highlight gaps and potential future research areas, but no quality assessment was performed in this scoping review.

INTRODUCTION

Sexual and reproductive health (SRH) is recognised as essential to a person's overall health and well-being.[1] Over the past two decades, considerable progress has been made in advancing the global agenda focused on ensuring access to high-quality SRH services.[2] However, accessibility remains inadequate in many countries due to limited resources, infrastructure, education, awareness of services or environmental barriers.[2] The far-reaching impact of unsafe abortions, unintended pregnancies, reproductive cancers and sexually transmitted and bloodborne infections (STBBI) on countries' health and socioeconomic development cannot be overemphasised.

Globally, pharmacists' roles have become more patient-focused and service-based in recent years, as compared to traditional roles that were more product focused.[3 4] The convenient location of community pharmacies

allows pharmacists to engage directly with several communities and promote access to healthcare services.[5–7] Legislative, policy and educational changes have enabled pharmacists to expand their scope of practice to address different and new health challenges.[8–10] However, pharmacy practice and pharmacy education, as well as legal and regulatory frameworks guiding pharmacy practice differ considerably worldwide.[11 12] Traditional pharmacy services are those typically provided in all pharmacies and include compounding and dispensing of prescription medications, providing drug information and supporting patient self-care with over-the-counter medications and products.[11] Various terms have been used in the literature to describe patient-focused pharmacy services, making international comparisons challenging. Professional pharmacy services is a broad term that refers to applying specialised health knowledge 'to optimise the process of care with the aim to improve health outcomes and the value of healthcare'.[13] Examples of professional pharmacy services include administering vaccines and other injectable medications, prescribing or renewing medications, smoking cessation, medication therapy management and disease screening or testing.[11–13]

While the model and scope of pharmacy practice differ between countries, the shift towards delivery of patient-focused services provides the opportunity to address the burden on primary healthcare systems and poor accessibility, especially in SRH. As one of the most accessible and trusted health professionals,[14 15] pharmacists are well positioned to take on a more significant role in delivering SRH services by removing practical barriers and connecting with other care providers.[15]

Examples of policy and regulatory changes to support improved access to SRH through community pharmacies can be seen around the globe. In many cases, pharmacists' roles in SRH have evolved from primarily dispensing to include professional pharmacy services such as patient education programmes, preventive, screening and referral services, according to regulations in each jurisdiction.[15–21] As an example, non-prescription progestin-only emergency contraception (EC) has been available at community pharmacies for more than 15 years in various European countries, Canada, the USA, Australia and New Zealand[22 23]; and ulipristal acetate (EC approved in 2009) was switched from prescription to non-prescription status in 2015 by the European Commission.[24] Further changes in several Canadian provinces and jurisdictions in the USA granted authority for pharmacists to prescribe hormonal contraception.[25 26] Pharmacists are also authorised to administer injections, such as injectable contraceptives and vaccines, in many parts of the world, including Canada, the USA, UK, Australia and New Zealand.[27]

Previous literature reviews on pharmacists' roles in SRH are focused on specific SRH areas or experiences related to SRH services. These include reviews of pharmacists' role in the supply of EC,[22] medical abortion provision,[28] HIV prevention[29] and STBBI screening.[30] Other reviews have also focused on pharmacists' and users' knowledge, attitudes, experiences and perspectives related to contraception as well as a broader spectrum of SRH services.[31–36] Overall, the available literature highlights positive users' experiences, implementation is feasible, and also some challenges for pharmacy staff and users. However, these reviews have not addressed the topic from the service organisation, implementation and delivery perspective.

Although interest in SRH has increased in recent years, there is little research synthesising professional pharmacy services across a broad spectrum of SRH areas.[33–36] Clarity is needed with respect to pharmacists' roles in SRH as well as the types of professional pharmacy services that may be delivered in community pharmacies to better serve the needs of the community. Addressing this gap in the literature is critical to position pharmacists as SRH providers, especially now that access issues have been exacerbated during the COVID-19 pandemic, and pharmacists are perceived as crucial in emergency response.[37] Therefore, this review aimed to identify research that described and evaluated professional pharmacy services provided by pharmacists across a broad range of SRH areas.

METHODS

Study design

Scoping review's framework and methodology are an excellent option for exploring SRH services offered at community pharmacies, pharmacists' roles in providing these services, and identifying knowledge gaps within the existing literature. The outcomes of this scoping review were to (1) identify the professional pharmacy services in SRH provided by pharmacists in community practice and (2) report on service description and evaluation.

The work was structured around the five stages of the framework recommended by Arksey and O'Malley[38] and enhanced by Levac *et al*[39]: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data and (5) collecting, summarising, and reporting the results. The review was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol extension for Scoping Reviews (PRISMA-ScR) guidelines.[40] The PRISMA-ScR checklist can be found in online supplemental file 1.

Search strategy

The search strategy was developed in consultation with a research librarian. Six health-science databases were searched for relevant peer-reviewed literature: Medline (Ovid), EMBASE (Ovid), CINAHL (Ebsco), Web of Science Core Collection (Clarivate), Scopus (Elsevier) and Cochrane Library (Wiley). We searched ProQuest Dissertations & Abstracts for grey literature, and hand-searched the reference lists of selected papers to identify any additional studies. There were no limits on language of publication. The search included studies published from 1 January 2007 to 22 July 2020. The time frame for inclusion was determined based on the publication dates

of previous reviews in this field, and the scope of pharmacist practice and policy changes in high-income countries worldwide that have impacted current practice. The articles were retrieved from each database and imported into EndNote (V.9, Clarivate Analytics) for management and screening.

Keywords included: pharmacists, sexual health, reproductive health, pregnancy, sexually transmitted disease* or sexually transmitted infection* or STD* or STI or STIs, prescriptions, screening, patient education, service (online supplemental file 2).

Screening and study selection

Study selection focused on peer-reviewed literature that described and evaluated delivery of professional pharmacy services in SRH. To be included, studies had to describe and evaluate (eg, assessed feasibility, uptake, or acceptability from users' perspective) an intervention. Articles were excluded if they did not describe how the intervention was organised, implemented or delivered, the setting was not a community pharmacy, a community pharmacist was not part of the intervention, outcomes reported were only about experiences, knowledge or attitudes of pharmacists, or if the research was incomplete or yet to be published (eg, conference abstracts). Studies conducted in low-income and middle-income countries were also excluded due to differences in health systems and regulation of community pharmacies and pharmacy professionals as compared with high-income countries (table 1).[41]

Articles were screened in two phases. Two investigators (JN and CAH) independently screened titles and abstracts of studies for eligibility. Both investigators (JN and CAH) reviewed the full text of articles identified as potentially relevant. Discrepancies were discussed until consensus was reached.

Data extraction and synthesis

A data extraction tool was developed in Excel (V.16.39, Microsoft) to record key information of included articles. Data were extracted by JN and reviewed by a second investigator for accuracy (NY, TJS or CAH).

A descriptive analysis including a numerical overview of the amount, type, and distribution of included articles, and a narrative synthesis were performed to fulfil the study objectives (JN, NY, TJS and CAH). Articles were grouped and synthesised by SRH areas and professional pharmacy services uncovered in the scoping review. Characteristics of studies and key findings were summarised, and studies were compared.

Patient and public involvement

No patient involved.

RESULTS

Figure 1 summarises study selection. The initial search yielded 6559 results after the removal of duplicates (figure 1). After screening titles and abstracts, 77 articles were retrieved for full-text review. From these, 41 articles were included in the review (online supplemental file 3).

Table 1 Eligibility criteria for studies included

Aspects of study design	Eligibility criteria
Population	People of all ages from high-income countries. Referred to as users, patients or individuals.
Intervention	Professional pharmacy services focused on SRH. Face-to-face interaction between provider and user.
Outcome	Description and evaluation of SRH services provided to real users of the services; mystery clients or simulated patients were excluded.
Setting	Community pharmacy; specialised pharmacy or pharmacy based in a hospital/clinic were excluded.
Provider	Community pharmacists had to participate in the intervention directly; services provided by clinical pharmacists or residents only were excluded.
Study design	Qualitative, mixed methods and quantitative. Descriptive studies (retrospective, cross-sectional or prospective), comparative and non-comparative studies were included; abstracts, protocols, reviews, letters, commentaries, editorials, opinions, meta-analysis and reviews were excluded.
Year	Articles published after 2007.
Language	No language restrictions.

SRH, sexual and reproductive health.

Study characteristics

In terms of research design, 27 studies were quantitative (non-randomised), 2 were cluster randomised and 2 were randomised controlled trials. Mixed methods were used in nine studies, and one study was qualitative. About 66% of studies reported additional training was provided to pharmacists in order to offer SRH services. Table 2 outlines characteristics of the studies included.

Most of the studies were conducted in the USA (n=20) or UK (n=13). Twenty-six (63%) studies focused on STBBI, 12 (29%) on contraception, 2 (5%) on pregnancy and 1 (2%) on sexual dysfunction. The most common professional pharmacy services provided by pharmacists were screening (39%), prescribing (17%), administration of injections (15%) and provision of medication by pharmacists (15%). Provision of medication was through specific protocol (eg, patient group directions or study protocol) or pharmacist only medications. Provision of medication through specific protocol included

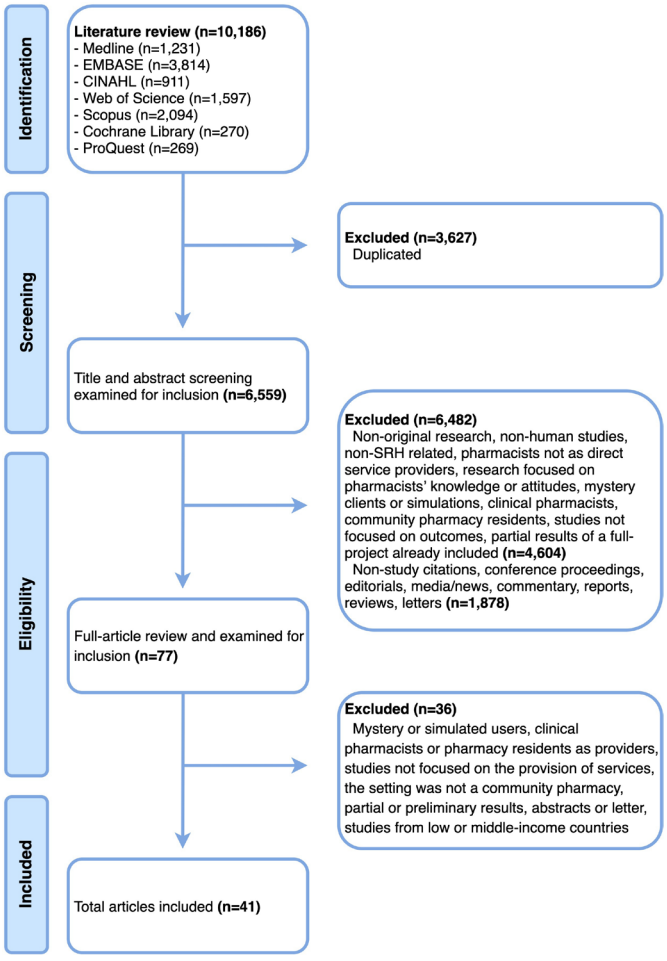

Figure 1 PRISMA flow chart and search results. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SRH, sexual and reproductive health.

pharmacists who provided medications because the legal framework allowed them (eg, vouchers for chlamydia treatment) while pharmacists only medication refers to medications that can be provided by pharmacists without a prescription (eg, EC). Other activities included education programmes and screening and treatment (as one service) (table 2). More than two-thirds of studies (71%) were published between 2015 and 2020. Figure 2 shows the number of articles included for each SRH area by year of publication.

SRH areas and services

Studies were categorised into four main SRH areas: STBBI, contraception, pregnancy and sexual dysfunction (online supplemental file 3). An overview of these studies is described in further detail below.

Sexually transmitted and bloodborne infections

Twenty-six studies evaluated STBBI services provided by pharmacists; 9 (35%) were *Chlamydia trachomatis* related, 7 (27%) were focused on HIV, 5 (19%) on human papillomavirus (HPV) and 5 (19%) on hepatitis C virus (HCV).

Table 2 Summary characteristics of studies included (n=41)

Characteristics	Studies n (%)
Region	
USA	20 (48.8)
UK	13 (31.7)
Australia	3 (7.3)
Canada	1 (2.4)
Spain	1 (2.4)
Greece and Spain	1 (2.4)
Puerto Rico	1 (2.4)
Norway	1 (2.4)
Research design	
Quantitative (non-randomised)	27 (65.9)
Quantitative cluster randomised trial	2 (4.9)
Quantitative randomised controlled trial	2 (4.9)
Mixed methods	9 (22.0)
Qualitative	1 (2.4)
SRH area	
STBBI	26 (63.4)
Chlamydia	9 (34.6)
HIV	7 (26.9)
HPV	5 (19.2)
Hepatitis C	5 (19.2)
Contraception	12 (29.2)
Hormonal contraceptives	7 (58.3)
Injectable contraceptives	3 (25.0)
Emergency contraception	2 (16.7)
Pregnancy	2 (4.9)
Sexual dysfunction	1 (2.4)
Reported additional training for pharmacists	
Yes	27 (65.9)
No	14 (34.1)
Professional pharmacy service	
Screening	16 (39.0)
Prescribing	7 (17.0)
Injection administration	6 (14.6)
HPV vaccine	3 (50.0)
Injectable contraceptives	3 (50.0)
Provision of medication by pharmacist	6 (14.6)
Specific protocol	4 (66.7)
Pharmacists only medication	2 (33.3)
Education programmes	4 (9.8)
Screening and treatment	2 (4.9)

HPV, Human papillomavirus; SRH, sexual and reproductive health; STBBI, sexually transmitted and bloodborne infections.

Chlamydia

Four of the nine studies evaluated pharmacists' involvement in chlamydia screening,[42–45] two evaluated

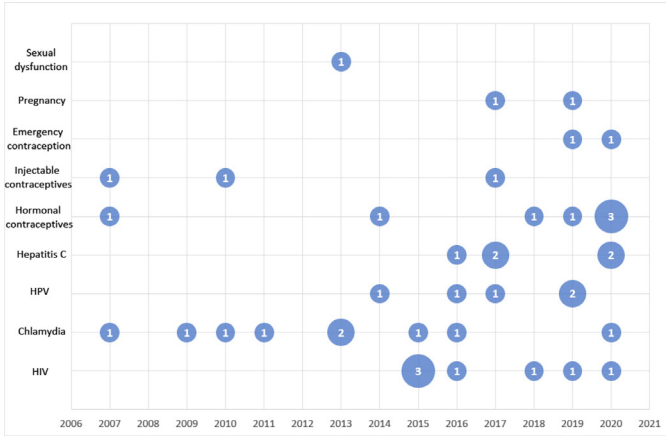

Figure 2 Systematic map—SRH topic and year of publication. Area of points are proportional to absolute values of number of studies. HPV, human papillomavirus; SRH, sexual and reproductive health.

screening along with treatment services,[46 47] and three evaluated treatment services only.[48–50] Screening for chlamydia was offered through distribution of chlamydia test kits,[42 44 46] or by collection of urine samples that were stored at the pharmacy and shipped to a pathology provider for analysis.[43 45] In one study, it was not clear how screening was performed.[47] Of the studies which evaluated treatment services only, two focused on treatment of partners,[48 50] and one focused on the treatment of index cases.[49]

In terms of studies that assessed chlamydia screening, the target population and sample size varied (online supplemental file 3). Studies using home test kits reported 18% and 28% of samples returned for testing.[42 44] In comparison, one study offered on-site screening (collection of samples) with an incentive for participants and pharmacists.[43] In this study, 75% of unique samples were returned to the pharmacy.[43] Positivity rates reported for chlamydia ranged from 0% to 9.8%.[42–44 46 47] Studies focused on treatment services used redeemable vouchers for free chlamydia treatment at participating community pharmacies. Cameron *et al* found 40% of the treatment vouchers were redeemed by partners of index cases.[48] Slutsker *et al* reported similar results; 41% of vouchers were redeemed even when the medication was free of charge.[50] Another study used the same methodology but for index cases with uncomplicated chlamydia and found that 87% of vouchers were redeemed.[49]

Overall, users reported a high level of satisfaction with the services provided.[44 45 47 48] Convenience,[44 45 47] location,[45] short waiting times and no appointments needed[44 45 47 48] and a non-judgemental approach[47] were reported as benefits. Barriers or challenges were also noted, including users' low awareness of service,[42 44] concerns regarding confidentiality and privacy,[44 45 47] and in some cases, inconvenience of returning specimens to designated pharmacies or laboratories.[42 44]

HIV

Among the seven studies focused on HIV, one evaluated pharmacist-led pre-exposure prophylaxis (PrEP),[51] and the remainder focused on HIV screening at the community pharmacy.[52–57]

Havens *et al* implemented a pilot whereby individuals started on HIV PrEP could choose to be followed by a pharmacist for ongoing sexually transmitted infections (STI)/HIV screening, follow-up, and PrEP prescribing.[51] Although the authors described logistical challenges related to STI screening, results indicated that implementing a pharmacist-led PrEP programme was feasible and achieved high satisfaction rates among participants.[51] The studies reporting HIV screening in community pharmacies varied in terms of duration, tests performed, and whether screening was offered as part of a pilot or an established programme. Most studies used rapid point-of-care testing (POCT) with finger-prick blood samples for screening,[52 54 55 57] and one used oral fluid samples.[56] Five studies reported referral and confirmatory testing for individuals with reactive results.[52 54–57] The authors reported 0.8%,[52 57] 0.9%[55], 1.5%[54] and 1.6%[56] of HIV rapid tests performed were reactive. Fernández-Balbuena *et al* reported findings from three programmes in Spain involving 110 pharmacies and found that pharmacy testing contributed to identifying 10% of new HIV cases in the region; a high percentage of heterosexual men were tested.[55]

Studies that focused on HIV screening demonstrated pharmacists are capable of reaching high-risk groups and individuals not previously tested.[52–57] Crawford *et al* evaluated uptake of HIV testing when part of comprehensive disease screening implementation in low access and minority communities.[53] Kelly *et al* and Fernández-Balbuena *et al* found as low as 27% and as high as 52% of individuals reported they were not previously tested for HIV (or were unsure).[55 57]

Some studies reported positive experiences with HIV screening at community pharmacies.[54 57] However, challenges were also reported, including recruitment and advertising,[54 56 57] obtaining the sample,[54 57] integration into the daily workflow,[57] pharmacists' remuneration,[54 57] costs[56] and referral and linkage to care.[52] Havens *et al* also described similar challenges for HIV PrEP services, such as integration into the daily workflow, pharmacist compensation, and cost for users and reimbursement policies.[51]

Human papillomavirus

Five studies explored professional pharmacy services focused on HPV vaccination. Two studies evaluated the implementation of HPV vaccination services at community pharmacies,[58 59] two focused on educational strategies and impact on vaccination rates,[60 61] and one focused on a patient assistance programme for university students and vaccination uptake.[62] Three studies targeted adolescents and/or younger adults,[58 61 62] one targeted individuals between 9 and 26 years old filling

acne or birth control prescriptions at the pharmacy,[60] and one did not specify the target group (online supplemental file 3).[59]

HPV vaccination service was offered directly through the pharmacy,[58 60–62] or by a health clinic that promoted a community pharmacy as an alternate setting to complete the vaccination series.[59] Regarding service promotion, different strategies were described. Calo *et al* included direct mailing to families with eligible children, radio and newspaper advertisements, posting fliers and promotion in the pharmacy using posters, bag stuffers, handouts, roadside signs and direct patient approach.[58] Other authors described similar strategies, with direct patient approach most commonly used.[59–62]

There were, however, important barriers reported in these studies. In some states in the USA, community pharmacies are not included as qualified vaccine provider sites for vaccinating age-eligible adolescents.[58] As a consequence, this limits the reach to young people and the integration of the service into primary care systems.[58] Parental beliefs about vaccination,[59 61 62] awareness of pharmacists' immunisation training[58] and information about available services[58 62] were also challenges reported.

Hepatitis C

All five studies focused on HCV screening services in community pharmacies.[63–67] In one study, pharmacists performed HCV-antibody rapid POCT,[65] and in four studies dried blood spot testing (DBST) was used.[63 64 66 67] One study reported DBST samples were tested for hepatitis B virus (HBV), HIV, and syphilis in addition to HCV, although results for these infections were not reported.[64] Two other studies reported testing samples for HCV, HBV and HIV.[66 67]

The screening services in these studies aimed to reach primarily high-risk groups, including individuals attending for needle exchange,[64] opiate substitution therapy[64 66 67] and those with limited access to care.[65] The percentage of tests completed that were reactive was reported to be 1.2%,[65] 7%[63 64] and 28%.[66] As part of the service, pharmacists consulted or referred patients with reactive tests to specialist care.[63–67] In two articles, Buchanan *et al* reported implementation in more than 20 community pharmacies a 'point-of-diagnosis' consultation with the pharmacist and a hepatologist for individuals with confirmed HCV infection.[63 64] Pharmacist services extended beyond screening to support patients' care following diagnosis. Buchanan *et al* reported that most patients remained actively engaged in care, and some of them started HCV treatment.[63 64] Radley *et al* reported that more patients in the pharmacist-led pathway for HCV initiated treatment and achieved HCV cure as compared with the conventional care pathway.[67]

Reported challenges implementing HCV screening services included motivating people to get tested,[65] careful time management by pharmacists to balance workload[63 65 66] and pharmacist remuneration.[65]

Contraception

Of the 12 studies focused on contraception, six studies assessed prescribing hormonal contraception,[68–73] three focused on injectable contraceptive administration[74–76] and two on EC provision.[77 78] One study compared two interventions, pharmacist-provision of 1 month of a bridging method of contraception or pharmacist referral to a family planning clinic, to standard care in women seeking EC.[79]

Five studies focused on the implementation of policies which support direct pharmacy access in some US states, and enable pharmacists to independently prescribe contraceptives for Medicaid-insured women.[68 70–73] Anderson *et al* found that community pharmacists in Oregon issued 10% of new contraceptive prescriptions (oral or transdermal methods) during 2016–2017.[68] In addition, Lu *et al* reported that pharmacists in Oregon and California prescribed different contraceptive methods, including oral (95.7%), patch (1.6%), vaginal ring (2.6%) and injectable (0.1%).[70] However, Gibbs and Harvey assessed the impact of this type of policy in Oregon during the first 2 years following implementation and concluded there was no significant increase in contraceptive use.[73] Still, they noted that women's satisfaction, convenience, cost, equity and impact on access and unintended pregnancy rates should be studied in the future when the demand for these services increases.[73]

Effective and consistent use of contraception is strongly related to access and supply. Rodriguez *et al* showed that pharmacists' prescription service was associated with improved contraception continuation rates as pharmacists were significantly more likely to prescribe a 6-month supply than other prescribers.[72] Pharmacists may also enhance access to contraceptive and SRH services through referral to other healthcare professionals and clinics for further care.[69 75 77 79] Mantzourani *et al* noted that 31% of EC consultations included a referral to a sexual health clinic or a general practitioner.[77] Monastersky Maderas and Landau found that pharmacy and clinic partnerships to expand access to injectable contraception resulted in reciprocal referrals.[75] Michie *et al* concluded that referral by pharmacists to a family planning clinic and pharmacists' provision of progestogen-only contraceptive pill were valuable and could increase the uptake of effective contraception after EC.[79]

Compared with other contraceptive methods, injectable contraceptives require more visits to clinics, which may be inconvenient for some individuals.[74 75] Pharmacists can assist women by administering injectable contraceptives at the time of picking up their refill.[74 75] Heller *et al* suggested that a pharmacy-based injection service for users of injectable contraceptives may be feasible, but the public viewed pharmacist availability as a barrier for access.[74] Some authors explored the potential of this service in partnership with a clinic. Picardo and Ferreri randomised women to receive the injection

at a community pharmacy or clinic,[76] and Monastersky Maderas and Landau gave women the option to continue receiving the injections at the clinic or a community pharmacy.[75] Convenient access to community pharmacies made this service feasible with high acceptance rates by women.[74–76]

Community pharmacies provide an important option for women to access EC.[77 78] According to 5-year trends, Mantzourani *et al* described consistent provision of a free pharmacy-based EC service in the UK to women of a wide age range.[77] Turnbull *et al* showed that users of over the counter EC preferred community pharmacies for the ease and speed of access and convenience.[78] Disadvantages included less personalised service by the pharmacist and subsequent need for EC.[78] Women in this study suggested enhancements including increased privacy and consultation to expand pharmacists' role in the provision of contraception.[78]

Pregnancy

Two studies addressed pregnancy and preconception care.[80 81] One of these tested the feasibility of a pharmacist consultation in early pregnancy.[81] The women reported high satisfaction rates, emphasising the importance of a telephone consultation, and the majority would recommend the service to other pregnant women.[81] DiPietro Mager *et al* demonstrated that pharmacists could offer targeted medication reviews to provide preconception education including folic acid use, medications that may cause fetal harm, and recommended vaccines in pregnancy.[80] This study found that community pharmacists rapidly integrated the service process and that a sustainable reimbursement model was feasible.[80]

Sexual dysfunction

One study assessed pharmacists' ability to detect erectile dysfunction (ED) and encourage individuals to seek medical advice.[82] Pharmacists used a questionnaire to gather clinical and behavioural questions and patients completed the validated Sexual Health Inventory for Men (SHIM) to identify those who might have ED (SHIM score ≤21). The results showed that 77% of men included in the study had a SHIM score ≤21 indicating ED, however only a minority of these men were able to be contacted by phone to determine if they visited a physician.[82] The authors concluded that pharmacists' roles in detecting, evaluating and motivating individuals to follow up with a physician need to be evaluated further.[82]

DISCUSSION

This scoping review aimed to identify and synthesise research that described and evaluated professional pharmacy services provided by pharmacists in SRH. Our results reveal pharmacists are engaged in a wide range of activities beyond traditional pharmacy services, signalling that pharmacists play a more significant role in delivering services in a number of SRH areas.

Generally, studies included in this review found the provision of SRH services by pharmacists enhanced access to care, users' experiences and the uptake of services. Our results are consistent with previous SRH research addressing users' experiences with pharmacy services, which have similarly reported the location of the pharmacy, extended opening hours, and no necessary appointments, as some of the pharmacies' advantages.[32 35 36] In a systematic review, Chirewa and Wakhisi found that young women considered obtaining EC through community pharmacies in the UK as convenient and easy to access.[32] In addition, a non-judgemental approach, receiving services from helpful pharmacists and free and confidential services, were considerations when choosing community pharmacies over other settings.[32] Similarly, Gauly *et al* reported in a systematic review that pharmacy users appreciated the convenience and easy access of pharmacies for SRH services and felt comfortable discussing sexual health with the pharmacist.[36] However, Gauly *et al* noted conflicting results about individuals' views on privacy. Some patients appreciated the privacy level provided in pharmacies while others expressed concerns about being overheard by other clients when talking to the pharmacist.[36]

SRH services provided by pharmacists at community pharmacies reached vulnerable and high-risk groups. The analysis of studies reporting interventions highlighted variable findings. Since positivity rates of STBBI vary depending on study and intervention designs, testing technology, jurisdictions, risk behaviours, population groups and year of implementation,[83] the variability in findings reported by the studies included in this review is not surprising. However, the advantages of reaching a significant proportion of first-time testers and high-risk populations increases STBBI awareness. Community pharmacies have been described as a healthcare 'hub',[84] and opportunities exist to promote and integrate SRH services to enhance access for underserved populations.[35] This is particularly relevant to emphasise now, as the COVID-19 pandemic has dramatically impacted public health, and SRH and rights are no exception. The pandemic has had repercussions on access to routine and preventive services, shortage of products and supplies and service delivery capacity.[85–87] This situation is likely to impact the most vulnerable populations disproportionately.[85 88 89] Positioning pharmacists as SRH providers could translate into the development of strategies using community pharmacies as an access point for patient-focused SRH care.

Legislative changes, availability of technology for screening and sample collection and partnerships, were found to be important enablers for pharmacists to deliver professional pharmacy services. For example, the availability of hormonal contraceptives and progestin-only EC pill in community pharmacies is due to approved

legislation in some states in the USA and Canada.[90–93] For STBBI, a community pharmacy is usually more conveniently located than a clinical testing site,[94 95] and advances in POCT, DBST and home test kits technologies enabled pharmacists to offer screening services for HIV, HCV and chlamydia outside traditional settings.[96] Similarly, care delivery models, including partnerships with sexual health clinics as well as physicians (eg, collaborative practice agreements), were also crucial for service establishment in some cases.

Our results also indicate several barriers to implementing SRH services at community pharmacies. Integration of services into the daily workflow,[57 59 66] pharmacists' remuneration,[51 57 63–65] cost and reimbursement for patients[51 55 56 62] and policy regulations[61] are commonly reported challenges. Introducing new policy approaches to boost and enhance community pharmacists' roles in SRH is still needed. For example, pharmacists are authorised to administer injections in every state in the US. However, state laws may limit pharmacists' ability to administer HPV vaccines based on the age of individuals and conditions under which they can administer HPV vaccines, such as independent authority, collaborative practice agreement, or another health professional prescription.[58 61] Additionally, parents' and patients' awareness of pharmacists' training and services,[42 44 50 54 56 57 62] concerns about pharmacists providing safe and high-quality services,[69] and motivation to opt into the services (eg, voluntarily ask for any STBBI screening service)[42 44 65] are some of the other challenges to overcome. In order for SRH services through community pharmacies to be sustainable and affordable, these barriers are paramount to address.

The findings from this review could help pharmacists visualise and understand their role in SRH and promote the value of professional pharmacy services. This review may also help support the implementation of SRH services in the community and the development of new policies in countries to expand pharmacists' roles in providing professional pharmacy services. The evidence supports the evolution of pharmacists' roles in SRH, from traditional product-focused to offering different professional pharmacy services. Given the potential feasibility, users' acceptability and reach, pharmacists are ideally situated to enhance access to SRH services now and in the future to better meet the needs of the public in areas such as contraception,[97 98] medical abortion[99] and STBBI treatment and prevention.[100]

As previously described, most studies focused on specific SRH areas. None of the studies evaluated the delivery of SRH services addressing patient needs in the areas of medical abortion provision, prescribing or referral for intrauterine contraceptive devices and subdermal implants, vaccine education and delivery in pregnant women (eg, tetanus, diphtheria and pertussis vaccine), nutritional advice in pregnant women and screening and treatment for other STI, such as gonorrhoea and syphilis. Studies on community pharmacy delivery of SRH services to lesbian, gay, bisexual, transgender, queer/questioning individuals in the community, who may face health disparities mainly related to SRH,[101] were not found. These gaps identified may be due in part to our search dates and inclusion criteria. However, these gaps highlight future research opportunities to examine pharmacists' roles in the delivery of comprehensive SRH services tailored to diverse populations which may better position pharmacists as SRH providers.

We developed the search strategy and set the eligibility criteria to capture evidence from real-life scenarios, which effectively represented what pharmacists may offer to the public. However, this approach may have limited the identification of contributory articles evaluating professional pharmacy SRH services since some studies may have explored this topic using mystery clients or simulated patients. Based on the studies included, we reported challenges and barriers that were highlighted. We considered it relevant to summarise similar reports across different SRH areas. Since we did not include articles focused on attitudes or experiences, the barriers acknowledged in this review may not represent all the barriers reported in the literature. Lastly, deciding to conduct a scoping review was based on the analytical approach which aims to map the data, the broad research question we identified, and the less restrictive inclusion of studies in terms of design and quality. A quality assessment of articles, as typically performed in a systematic review, was not completed. Future work might conduct a quality assessment of studies in this research area by taking the findings from this scoping review as a precursor of a systematic review.

CONCLUSIONS

Given that accessibility to SRH services remains an issue in many countries, it is relevant to recognise pharmacists as SRH providers. This scoping review has identified that pharmacists' roles have expanded beyond traditional product-focused services and the delivery of professional pharmacy services in a number of SRH areas is feasible and highly accepted by users. Still, the available evidence suggests several challenges need to be addressed to position pharmacists as sustainable and affordable providers of SRH services in high-income countries worldwide. Based on identified gaps, studies describing the implementation and evaluating the impact of a full spectrum of professional pharmacy services may promote access to SRH care through community pharmacies and position pharmacists as SRH providers.

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Acknowledgements JN acknowledges the National Agency for Research and Development (ANID)/Scholarship program for supporting her research (Master Becas Chile/2018 – 73190318). The authors wish to acknowledge Meghan

Sebastianski (PhD) and Diana Keto-Lambert (MLIS) from the Alberta Strategy for Patient-Oriented Research (SPOR) SUPPORT Unit Knowledge Translation Platform for their support with the search strategy and database searches, and Dary Chen for his help during the data extraction stage.

Contributors JN: conceptualisation, methodology, investigation, analysis, writing-original draft. NY and TJS: analysis, writing-review and editing. CAH: conceptualisation, methodology, investigation, analysis, supervision, writing-original draft, review and editing. All authors approved the final manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as online supplemental information. No additional data available.

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Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	2
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
INTRODUCTION			4-5
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	NA
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	6
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	S2
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	6-7
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	7 NA
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	

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SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			8 F1
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	8-9
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	NA
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	S3
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	9-14
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
DISCUSSION			15-17
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	17
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	17-18
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	18

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

Ovid-Medline Search Strategy

#	Searches	Results[a]
1	Pharmacists/	16225
2	Pharmacies/	7760
3	Pharmaceutical Services/	8236
4	Community Pharmacy Services/	4459
5	((pharmacy* or pharmacies* or pharmacist*) and (chain* or independent or local or communit* or over-the-counter)).tw,kf.	14447
6	(pharmaceutical service* and communit*).tw,kf.	218
7	or/1-6 [MeSH & KEYWORDS FOR COMMUNITY PHARMACISTS]	36547
8	exp sexually transmitted diseases/	335793
9	Chlamydia trachomatis/	11871
10	Herpesvirus 2, Human/	4265
11	Neisseria gonorrhoeae/	9666
12	exp Hepatitis B/	57210
13	Hepatitis B Virus/	26393
14	Orthohepadnavirus/	33
15	exp Hepatitis C/	62836
16	Hepacivirus/	32492
17	exp HIV/	97446
18	exp HIV Infections/	277925
19	exp Papillomavirus Infections/	33521
20	exp Papillomaviridae/	32057
21	Papillomavirus vaccines/	7413
22	exp Syphilis/	27507
23	Treponema pallidum/	4000
24	Sexual Behavior/	55085
25	Sexual Health/	782
26	Safe Sex/	3119
27	Unsafe sex/	4714
28	exp Contraception/	26466
29	exp Contraceptive devices/	24933
30	exp Contraceptive agents/	69566
31	exp vaccines, contraceptive/	329
32	Levonorgestrel/	4191
33	Pregnancy/	863382

34	Pregnancy complications/dt	7819
35	Pregnancy Tests/	3718
36	exp Infertility/	64867
37	exp Fertility agents/	29256
38	Maternal health/	1251
39	exp "Sexual and Gender Minorities"/	5443
40	exp Hormone replacement therapy/	24562
41	exp Sexual Dysfunctions, Psychological/	26248
42	exp Sexual Dysfunction, Physiological/	29546
43	exp Abortion, induced/	39776
44	exp Reproductive Health Services/	39030
45	Reproductive Health/	3131
46	exp Breast feeding/	36872
47	(sexually-transmitted disease* or sexually-transmitted infection* or STD* or STI or STIs).tw,kf.	42118
48	Chancroid.tw,kf.	943
49	Chlamydia.tw,kf.	24805
50	condyloma*.tw,kf.	4398
51	genital herpes*.tw,kf.	3117
52	genital wart*.tw,kf.	2463
53	gonorrhea.tw,kf.	7860
54	hepatitis B.tw,kf.	77251
55	hepatitis C.tw,kf.	76235
56	(HIV* or human immunodeficiency virus*).tw,kf.	328780
57	(lymphogranuloma or LGV).tw,kf.	2246
58	papillomavirus.tw,kf.	36834
59	syphilis.tw,kf.	28351
60	trichomon*.tw,kf.	9650
61	family planning.tw,kf.	40781
62	(contracept* or birth* control*).tw,kf.	74693
63	condom*.tw,kf.	21267
64	diaphragm*.tw,kf.	46194
65	cervical cap*.tw,kf.	269
66	vaginal ring*.tw,kf.	1002
67	(intrauterine device* or intra-uterine-device* or IUD*).tw,kf.	12064
68	((male or female) adj2 steril*).tw,kf.	11679

69	Gardasil.tw,kf.	480
70	Plan B.tw,kf.	251
71	pregnan*.tw,kf.	512065
72	infertil*.tw,kf.	61090
73	fertil*.tw,kf.	177105
74	(transgender* or (trans adj2 gender*)).tw,kf.	5726
75	(Sexual adj2 (dysfunction* or function*)).tw,kf.	21698
76	abortion*.tw,kf.	61414
77	sexual health.tw,kf.	9632
78	reproductive health.tw,kf.	14294
79	((maternal or perinatal or reproductive) adj2 health).tw,kf.	27309
80	(breast feeding* or breastfeeding* or breast-feeding*).tw,kf.	37455
81	or/8-80 [MeSH & KEYWORDS FOR SRH AREAS]	2092365
82	Professional Role/	13339
83	Professional Competence/	24048
84	Directive Counseling/	2308
85	Education, Pharmacy/	5809
86	Health Promotion/	72141
87	Family Planning Services/	24586
88	exp Maternal Health Services/	47925
89	Mass Screening/	101027
90	Patient Education as Topic/	83962
91	"Referral and Consultation"/	65092
92	Prescriptions/	3262
93	Electronic Prescribing/	996
94	exp Injections/	280915
95	exp vaccination/	82802
96	immunization/	50252
97	testing*.tw,kf.	533813
98	screening*.tw,kf.	515787
99	prescrib*.tw,kf.	142441
100	dispens*.tw,kf.	37224
101	(advice or advise or counseling or counselling).tw,kf.	143589
102	guidance.tw,kf.	108845
103	educat*.tw,kf.	594160
104	instruct*.tw,kf.	92660

105	consult*.tw,kf.	123408
106	refer*.tw,kf.	803410
107	program*.tw,kf.	860715
108	service*.tw,kf.	510381
109	(partner* adj2 therap*).tw,kf.	441
110	(partner* adj2 notif*).tw,kf.	1030
111	or/82-110 [MeSH & KEYWORDS FOR SRH ACTIVITIES/PROGRAMS]	4104910
112	7 and 81 and 111 [PHARMACISTS' ROLES IN SRH AREAS]	1775
113	limit 112 to yr="2007 -Current"	1160

[a] Run Date: July 22, 2020

Primary author and year of publication	Objective/s (to)	Study location	Professional pharmacy service	Category of study design	Target population for pharmacists' SRH service	Study summary
Sexually transmitted and Blood-borne infections (STBBI)						
Brabin et al. (2009)[42]	Assess the uptake of free postal chlamydia screening by women who requested EHC	UK (Manchester)	Chlamydia screening	Quantitative	Women under 25 years requesting emergency contraception	• Based on tracking forms from 33 pharmacies during 1-year study: - 1,348/2,904 (46.4%) women accepted the testing kit - 236/1,341 (17.6%) kits returned and 24 (9.1%) positive • Significant increase in positive tests with age (OR=1.2/year; 95% CI: 1.04-1.44; p=0.015)
Currie et al. (2013)[43]	Determine if a cash reward increased the uptake of chlamydia screening in community pharmacies	Australia (Australian Capital Territory)	Chlamydia screening	Quantitative	Sexually active individuals 16-30 years of age	• 6 pharmacies participated over a 4-week period • 970/979 (99.1%) samples returned; 900/970 (92.8%) appeared to be urine • 671/900 (74.4%) were from unique individuals • 422/671 (62.9%) screened were men • 30 samples from 19 individuals tested positive (positivity rate 2.8%); highest rate (8%) in women 21-25 years • Positivity rate for pharmacy study comparable to overall positivity rate • 11 out of 19 (58%) who tested positive contacted and eight of them treated at sexual health clinic
Gudka et al. (2013)[44]	Develop and measure the effectiveness and acceptability of a pharmacy-based chlamydia screening intervention	Australia (Perth)	Chlamydia screening	Mixed methods	Asymptomatic women ≥18 years requesting emergency contraception	• 20 pharmacies participated in a 6-month study 247/596 (40.4%) women offered testing agreed to participate • 166/247 (67%) were eligible and were provided with a testing kit • 46 (28%) returned a completed test kit of which all were negative • 91/166 (55%) completed telephone interviews • Key findings from consumer focus group (n=5): ensure use of separate consultation

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						area, make available at all times from all pharmacies advertise service, increase venues for returning completed specimen, consider postal returns, give multiple options for obtaining results
Parker et al. (2015)[45]	Describe young participants' experience of, and views about, pharmacy-based chlamydia screening	Australia (Australian Capital Territory)	Chlamydia screening	Mixed methods	Sexually active individuals 16-30 years of age	• 979 chlamydia tests distributed and 945 (96.5%) questionnaires returned • 619 (66%) who participated in study and completed questionnaire were males > 60% of questionnaire respondents felt payment affected decision to have chlamydia test • Semi-structured interviews completed in 18 individuals • Overall, participants highly satisfied with screening service and accessibility was a facilitator • Privacy, confidentiality, and information transfer were cited as barriers
Anderson et al. (2011)[46]	Describe positivity rate by age and gender, profile of users, and determine if the program succeeded in reaching those who are currently being missed in other clinical settings	UK (England and Wales)	Chlamydia screening (and treatment)	Quantitative	Individuals ≥ 16 years of age	• Data from first 2 years of service at major UK pharmacy chain (1000 pharmacies) • 14,378 tests were performed • Positivity rate in males (9.8%) higher than females (6.8%) • Positivity rate highest in age 16-24 group (12.5%) • Out of 1,131 people who tested positive, 533 (47.1%) accessed and paid for treatment at the pharmacy and 133 (25%) partners also accessed treatment
Baraitser et al. (2007)[47]	Assess the feasibility of the program and evaluate uptake and client/ practitioner satisfaction	UK (London)	Chlamydia screening (and treatment)	Mixed methods	Not specified	• Data from a 3-month pilot in 3 pharmacies, 83 tests were taken • 73 (94%) of those tested were women • 8 (9.5%) tests positive; 5/8 (62.5%) treated at pharmacy • 13/ 80 (16%) reported they would not have been tested without the pilot • 64/80 (80%) very satisfied and 11 (14%) were satisfied • All felt very comfortable or comfortable discussing sexual health with pharmacists

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						• Clients valued convenience and speed, non-judgmental approach
Cameron et al. (2010)[48]	Evaluate expedited partner therapy at a pharmacy as an additional choice to treatment at other health facilities	UK (Lothian)	Chlamydia treatment (expedited partner therapy)	Quantitative	Sexual partners of index cases with uncomplicated *c. trachomatis* only	• 90 pharmacies agreed to participate (18-month pilot); 57/90 pharmacies (63%) were used by partners • 231/577 (40%) vouchers issued to chlamydia-positive index patients redeemed at pharmacies • 60/67 index patients completed satisfaction survey • 46 (77%) were very satisfied or quite satisfied with having voucher to pass onto partner
McClure et al. (2016)[49]	Evaluate expedited treatment of index patients through the use of paper 'treatment vouchers' that could be redeemed at community pharmacies	UK (Lothian)	Chlamydia treatment	Quantitative	Individuals ≥ 16 years of age with uncomplicated *C. trachomatis* only	• Over a 12-month period, 300 vouchers issued by sexual and reproductive clinics (15.5% of patients tested positive for chlamydia) • 261 (87%) redeemed by index patients • Median number of days for voucher redemption was 1 day (range 0-126) • 185 (63.6%) of index patients receiving vouchers were females • Voucher issue increased with higher deprivation level of area of residence of index patient
Slutsker et al. (2020)[50]	Examine whether expedited partner therapy prescriptions (vouchers) are filled at community pharmacies when the cost barrier is removed	US (New York, Maryland, California)	Chlamydia treatment (expedited partner therapy)	Quantitative	Patients diagnosed with Chlamydia who would normally receive EPT prescription	• 32 clinical sites participated and distributed 931 vouchers for 28 months • 382 (41%) of issued vouchers were redeemed Vouchers given to patients 18 or younger were less likely to be redeemed than those given to patients older than 18 years (30% vs. 44%, p=0.001) • 196/353 vouchers were redeemed the same day
Havens et al. (2019)[51]	Investigate the acceptability and feasibility of a pharmacist-led HIV screening and PrEP program	US (Nebraska)	HIV PrEP prescribing	Quantitative	HIV-uninfected patients ≥ 19 years of age at high risk of HIV based on risk factors	• 27/60 (45%) individuals started on PrEP chose to continue follow-up through community pharmacy (one participating pharmacy) • 8 out of 27 remained on PrEP at 12 months

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						• PrEP medication adherence was high for those retained in care throughout the study (mean medication possession ratio 93%) • All respondents reported they would recommend the PrEP program • Areas that needed improvement were ease of accessing medication, confusion regarding rectal and pharyngeal STI swab collection, and delayed communication between providers • No participant had seroconverted at the time of publication
Collins et al. (2018)[52]	Describe the HIV testing program and summarize its outcomes	US (Virginia)	HIV screening	Quantitative	Individuals ≥ 18 years of age	• 32 stores involved in testing –3,630 tests completed over 27 months • 58.5% of those tested were male and 46% had never been tested or were unsure if they had been tested • 39.0% were administered during traditional business hours (9 AM to 6 PM, Monday through Friday) and 61.0% were administered outside of traditional business hours (6 PM to 9 AM, Monday through Friday) or on weekends • 30 (0.8%) reactive tests for HIV antibodies • 26 (86.7%) had a positive confirmatory test and 4 (13.3%) were lost to follow-up • 22/26 with confirmed infection linked to care
Crawford et al. (2016)[53]	Evaluate HIV testing uptake patterns when HIV testing is offered as part of a comprehensive chronic disease screening program	US (New York)	HIV screening	Quantitative	Injection drug users ≥ 18 years of age and un- or underinsured customers	• 3 pharmacies offered testing (2 intervention arms and 1 as control) • When adjusted for age and race/ethnicity, testing uptake was not significant different in the comprehensive disease screening arm (n=255), HIV testing (n=193) and video arm, and control arm (n=240) • 36.9% reported at least one form of HIV shame, and 52.8% reported at least one form of HIV blame • In those who reported at least one form of HIV shame or blame, those in video arm were 1.59 (95% CI [1.00,2.53]) times more likely to get tested than control arm after adjusting for age and ethnicity. Those in comprehensive arm were 1.61 (95% CI [1.03,2.49]) times more likely to be tested than control

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Darin et al. (2015)[54]	Evaluate the acceptability and feasibility of pharmacist-provided rapid testing for HIV	US (Michigan)	HIV screening	Quantitative	Individuals ≥ 18 years of age	• 69 HIV tests performed at 2 pharmacies over 17-month period • 1 (1.5%) reactive test – immediately referred for confirmatory testing • HIV testing service required a median time of 30 minutes • 59.5% of those tested were females, and 46.4% were black • 42% reported this was their first HIV test • Participants reported positive perceptions about the testing experience • 27.5% responded they were willing to pay for HIV test, and 63.7% said that they might pay pending on the cost
Fernandez-Balbuena et al. (2015)[55]	Assess the feasibility and the main outcomes of three programs for HIV screening	Spain (Basque Country, Castilla y León, Catalonia)	HIV screening	Quantitative	Individuals ≥ 16 years of age	• 24,151 people got tested at 110 pharmacies in different regions of Spain (Basque Country, Catalonia, Castilla y Leon), over a 2-4-year period • 226 reactive tests overall • Pharmacy-testing program contributed to 8.7%, 10.3%, and 12.7% of all the new HIV diagnoses in the three regions during the time period of testing
Weidle et al. (2014)[56]	Test the feasibility of offering rapid, point-of-care HIV testing at community pharmacies and retail clinics	US	HIV screening	Quantitative	Not specified	• Over a 2-year period, 21 sites including 18 community pharmacies offered testing • 1,540 total HIV tests were performed and 24 (1.6%) resulted in reactive test • 16/24 reactive tests outcome of confirmatory testing unknown to site staff • 5/8 reactive tests were false-positive on confirmatory testing, 2 were previously diagnosed with HIV, and one confirmed as new HIV case • The median amount of time required for pretest counseling/consent, waiting for test results, and posttest counseling was 4, 23, and 3 minutes, respectively

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Kelly et al. (2020)[57]	Develop and assess the implementation of a novel pharmacy-based HIV testing model in two Canadian provinces	Canada (Alberta and Newfoundland)	HIV screening	Mixed methods	Individuals ≥ 18 years of age who had active healthcare number	• 4 pharmacies participated, during 6-month study Of 123 tests, 1 was reactive and confirmed as new HIV diagnosis • Participants were primarily male (75.6%) and most common risk behavior was MSM (47.1%) 27.3% reported this was their first HIV test • Participants were very satisfied with the program; 99% agreed HIV POCT should be routinely offered in pharmacies and 78% were willing to pay for the service • Participants liked the accessibility of the pharmacy and convenience of POCT as well as the anonymity of the pharmacy • The main concern reported was related to the pipette used for blood collection
Calo et al. (2019)[58]	Evaluate the implementation of HPV vaccination services in community pharmacies	US (North Carolina, Michigan, Iowa, Kentucky, and Oregon)	HPV vaccination	Quantitative	Adolescents and young adults (no age specified)	• Open enrollment at 15 pharmacy sites in 5 states for combined 12 months • 13 HPV vaccine doses administered in adolescents and 3 doses to young adults • Engagement barriers included low demand from parents and pharmacy staff engagement • Feasibility, adoption, sustainability impacted by lack of 3rd party reimbursement, care coordination, and public awareness of pharmacists' training • Parents who got HPV vaccine for their children in participating pharmacies found the service highly acceptable • Participating pharmacists were knowledgeable about vaccines in general not just HPV vaccine, had the training to immunize adolescents, and were able to report vaccines administered to state immunization registries • Protocols and procedures were not well integrated into pharmacy workflow
Doucette et al. (2019)[59]	Assess the feasibility of a coordinated model of HPV vaccine delivery between a clinic and a community pharmacy	US (Iowa)	HPV vaccination	Quantitative	Not specified	• 51 patients referred to a single pharmacy to receive 2nd and 3rd doses of vaccine • 23 out of 51 patients received a total of 25 vaccinations • 18 (78.3%) were female

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Hohmeier et al. (2016)[60]	Describe and report on the impact of a multimodal series of pharmacist-led educational interventions on HPV vaccination rates	US (Tennessee)	HPV educational intervention	Quantitative	Individuals of 9-26 years of age filling acne or birth control prescriptions	• Data collected from one pharmacy over an 8-week period. There was a total of 21 questionnaire respondents • 10 out of 21 participants targeted for counselling on HPV vaccine were vaccinated at the pharmacy • Most common reasons for not receiving vaccine were cost (n=6) and insurance coverage (n=5) • Patient awareness and obtaining vaccine most often reported to be as a result of pharmacist recommendation (n=10 and n=6, respectively) • Patients more likely to choose the pharmacy as vaccination site due to no appointment necessary (n=8) and convenience hours (n=4) • Cost (n=6) and insurance coverage (n=5) were the most common reasons for the ones not receiving the vaccine
Jiménez-Quiñones et al. (2017)[61]	Observe whether local HPV vaccination rates are improved by a patient and physician education program	Puerto Rico (Lares)	HPV educational intervention	Quantitative	Individuals between 18-26 years of age	• 79 of the 200 patients were candidates to receive the HPV vaccine were reached by phone to invite them to an HPV related educational session • 24/79 reported being previously vaccinated for HPV • 4/79 patients received HPV vaccination during the study period
Navarrete et al. (2014)[62]	Describe the development and implementation of an HPV vaccine patient assistance program for university students	US (Texas)	HPV vaccination	Quantitative	Students ≥ 19 years of age	• Over 2-year period, 167 vaccine doses administered at community pharmacy located in a university setting • 89 individuals received approval from a vaccine patient assistance program • 81% (n=72) of all patients approved by the program were women • 79.8% students (n=71) received their second dose and 48.3% (n=43) completed the series • 46 individuals did not complete HPV series

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Buchanan et al. (2020)[63]	Describe the cost-effectiveness of a community pharmacy testing service in a population of people at risk of HCV	UK (Isle of Wight)	HCV screening	Quantitative	Clients with known risks factors for HCV	• 186 tests conducted over 24 months by 20 pharmacies • Majority of tests performed in males (53%) and most common disclosed risk factor was injection drug use (37%) • 13 (7%) were positive for HCV RNA; 10 of these had a history of current or former injection drug use • 12/13 attended point-of-diagnosis appointment with a specialist at the community pharmacy • 6/13 individuals were treated and achieved sustained virologic response
Buchanan et al. (2016)[64]	Reduce the burden of undiagnosed HCV and link new diagnoses directly to specialist care	UK (Isle of Wight)	HCV, HBV, HIV, and Syphilis screening	Quantitative	Clients attending for needle exchange and opiate substitution therapy	• 22 pharmacies participated over a 9-month period (5 did not complete any tests) • 88 tests were performed • Primary risk factor disclosed for undergoing testing was injection drug use (39%) • 16 (18%) presented for testing due to publicity campaign and the rest recruited by the pharmacists • 7% of patients tested were positive for HCV (similar to 9% who tested HCV positive at island recovery integrated service during same time period) • HCV positive patients attended point-of-diagnosis consultation with testing pharmacist and hepatology specialist
Dong et al. (2017)[65]	Describe the first community pharmacy-based hepatitis C antibody (HCV-Ab) point-of-care (POC) screening program and its outcomes	US (California)	HCV screening	Mixed methods	Not specified	• 83 tests were performed in a 3-month pilot at 1 pharmacy • Person-to-person outreach on street was most effective approach to encourage testing • 80% denied previous HCV testing • Most common self-identified HCV risk factors was birth cohort (65%) • 1/83 had positive HCV Ab (no information on confirmatory testing and linkage to care)

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Radley et al. (2017)[66]	Compare uptake of dried blood spot testing (DBST) for HCV infection between community pharmacies and established services	UK (Scotland)	HCV screening (DBST also screened for HBV and HIV but this was not reported)	Mixed methods (quasi-experimental)	Patients in receipt of opioid substitution therapy (OST) not tested for HCV within 12 months	• 6 pharmacies provided OST for approximately 363 patients • 43 tests were performed in a 1-year period • 43/143 patients in receipt of opioid substitution therapy with no record of testing accepted DBST • 12/43 reactive tests • Significant difference in uptake between community pharmacies and established services (30% vs 13%, respectively) • Participants reported that pharmacies were a good place to be tested and valued the service and they are seen as part of the local community
Radley et al. (2020)[67]	Evaluate whether a pharmacist-led care pathway compared with conventional care could increase HCV testing, treatment uptake and completion, and cure rates	UK (Scotland)	HCV screening (DBST also screened for HBV and HIV but this was not reported)	Quantitative - cluster-randomized trial	Patients who had received opioid substitution therapy (OST) for approximately 3 months, and were HCV PCR positive, were infected with HCV genotype 1 or 3, and were willing to have a pharmacist supervise their antiviral drug administration	• 55 participating pharmacies included 2,718 patients receiving OST (1,365 in the pharmacist-led care group and 1,353 in the conventional care group) • More patients in the pharmacist-led care group versus the conventional care group: - Met the primary endpoint of SVR12 in the pharmacist-led care group (98 [7%] of 1365) than in the conventional care group (43 [3%] of 1,353; odds ratio 2·375, 95% CI 1·555–3·628, p<0·0001). - Agreed to dry blood spot testing (245 [18%] of 1,365 vs 145 [11%] of 1,353, 2.292, 0.968–5.427, p=0.059) - Initiated treatment (112 [8%] of 1,365 vs 61 [4%] of 1,353, 1·889, 1.276–2.789, p=0.0015) - Completed treatment (108 [8%] of 1,365 vs 58 [4%] of 1,353, 1.928, 1.321–2.813, p=0.0007). No serious adverse events were recorded

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Contraception						
Anderson et al. (2019)[68]	Describe early utilization of pharmacist prescription of contraception	US (Oregon)	Hormonal contraception prescribing	Quantitative	Patients obtaining a new prescription for oral and transdermal methods and who had continuous Medicaid coverage	• Retrospective analysis of claims data from the first 2 years following a policy change • 162 pharmacists prescribed contraception resulting in 1,313 fill claims • 367/3,614 (10%) patients received their prescription from a pharmacist • Average of 61 prescriptions per month filled by pharmacists as the prescriber five months after implementation • The most common method of contraception prescribed was the combined OC (90.5%) • The majority of patients who were prescribed contraception by pharmacists (73.8%) had no history of contraceptive prescriptions in the preceding 30 days
Gardner et al. (2008)[69]	Describe implementation of a collaborative drug therapy protocol for safe use of hormonal contraceptives prescribed by community pharmacists	US (Seattle)	Hormonal contraception prescribing	Mixed methods	Women between 18-44 years of age in need of contraception	• 26 pharmacists participated over an 18-month period • 195/214 (91%) women recruited into the study were prescribed hormonal contraceptives by pharmacists • Most women (87%) were experienced users of hormonal contraceptives • More than 80% of women paid for the pharmacist's services out of pocket • After 12 months, 70% of women responding to an interview reported continuing use of hormonal contraceptives • Women were satisfied with the experience
Lu et al. (2019)[70]	Describe hormonal contraception services provided by pharmacists and characterize patient populations utilizing the service	US (California and Oregon)	Hormonal contraception prescribing	Quantitative	Women, and women ≥ 18 years of age or younger with previous contraceptive use (in California and Oregon, respectively)	• 381 pharmacists from a pharmacy chain provided hormonal contraception (HC) services in 391 locations during a 7-month period • 2,117 visits during the study period, and 1,970 (93%) received hormonal contraception from a pharmacist • 91% of women were previous HC users • HC prescribed included pill (95.7%), vaginal ring (2.6%), transdermal patch (1.6%), and injectable depot (0.1%)

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Rodriguez et al. (2020)[71]	Describe reasons for and experiences with obtaining contraception from pharmacists	US (California, Colorado, Hawaii, and Oregon)	Hormonal contraception prescribing	Quantitative	Women aged 18-50 years presenting for hormonal contraception at community and university pharmacies	• Planned secondary analysis from prospective cohort study • 426 women presenting for hormonal contraception (n=150 pharmacist prescribers) • Most common reasons received contraception from a pharmacist was because no appointment required (25%), their prescription had lapsed (24%), and location was convenient (24%) • Women who received contraception through a pharmacy were more likely to report they would use the same provider again versus women who used clinic-based prescriptions (100% vs 95.3%, p=0.007), as well as were more likely to refer a friend (9.0% vs 93.5%, p=0.04)
Rodriguez et al. (2020)[72]	Compare the amount of hormonal contraceptive supply dispensed between pharmacists and clinic-based prescriptions	US (California, Colorado, Hawaii, and Oregon)	Hormonal contraception prescribing	Quantitative	Women aged 18-50 years who received at least 1 month of hormonal contraception from a clinician or pharmacist	• Data collected over 9-month period in 2019. 139 pharmacies participated (California, 46; Colorado, 14; Hawaii, 10; and Oregon, 69) • 144/410 women obtained contraception from a pharmacist • Pharmacists were significantly more likely to prescribe a 6-month or greater supply of contraceptives than clinicians (6.9% vs 1.5%, p<0.001) • Pharmacists were as likely as clinicians to prescribe a progestin-only method to women with a potential contraindication to estrogen (n=60 women; 8 [20.0%] vs 6 [30.0%], p=0.52)
Gibbs & Harvey (2020)[73]	Assess the impact of a policy that allows pharmacist prescribing of the pill and patch on contraceptive receipt for Medicaid-insured women	US (Oregon)	Hormonal contraception prescribing	Quantitative	Women aged 15-44 years enrolled in Medicaid filling new prescriptions for contraceptives	• 2 years Medicaid data was used to compare before and after the policy implementation (2015-2017) • No significant effects of the policy change on receipt of all contraceptive services or on receipt of the pill or patch • In the first 2 years after policy implementation, greater than 98% of prescriptions filled for the pill and patch were prescribed by a non-pharmacist provider

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Heller et al. (2017)[74]	Examine the feasibility and acceptability of users receiving the subcutaneous form of the contraception injection from pharmacists	UK (Scotland)	Contraceptive injection administration	Mixed methods	Women between 15-45 years who had been using the contraceptive injection for at least six months	• 11 pharmacies participated over a 25-month period in pilot • Global unavailability of the product during the study adversely affected recruitment and retention • 50/78 women approached for study participation were recruited • 48 injections out of a possible 150 were administered at the pharmacy • 26 (54%) participants chose not to continue with the study after one or two injections • 22 women completed an exit questionnaire (44% of participants, 92% had experienced the intervention) • Participants reported mixed experiences, with some welcoming the intervention but others experiencing difficulty with pharmacist availability
Monastersky Maderas & Landau (2007)[75]	Explore the potential of pharmacist-administered contraceptive injections and feasibility and acceptability among patients	US (California)	Contraceptive injection administration	Mixed methods	Women using injectable contraceptive	• Over a 2-year period, 26 community pharmacies offered injectable contraceptive administration as a demonstration program • 69 women received 143 depot medroxyprogesterone injections • 60% of participants had their injections paid for by state-funded health insurance programs • Approximately 50% of users would be willing to pay a set fee (up to $10) for the pharmacist injection service • One half of the women used the service more than one time
Picardo and Ferrari (2010)[76]	Assess the feasibility of administering subcutaneous hormonal contraceptive in a pharmacy setting and assess patient satisfaction.	US (North Carolina)	Contraceptive injection administration	Quantitative - Randomized controlled trial	English-speaking women ≥ 18 years of age	• Women randomized to receive second and third dose at one clinic or one community pharmacy located in a shopping mall • 50 participants, 25 in each group (pharmacy or clinic) • Most women found the pharmacy setting convenient (70%), private (100%), the providers respectful (100%) and were satisfied with DMPA-SC and the pharmacy as a clinical site (≥89%). • Continuation rates and patient satisfaction with

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						• The contraceptive method and the pharmacy setting were comparable to those who attended a family planning clinic
Mantzourani et al. (2019)[77]	Describe long-term trends in the use of community pharmacist-based EC services and insight into changing patterns of EC use over time.	UK (Wales)	Emergency contraception provision	Quantitative	Women ≥ 13 years of age	• Evaluated the National Health Service funded community pharmacy EC service over a 5-year period • 181,359 consultations were recorded (authors unable to track repeat EC service users) • No data on the number of pharmacists in Wales, or the number of pharmacies • More than a quarter of the consultations were conducted on a Monday (25.8%) • More than two-thirds of requests made through the EC service took place within 24 hours of UPSI (67.5%) • Almost half (47.9%) of requests were because no contraception had been used • Levonorgestrel was supplied in 96.7% of the consultations • Further sexual health and contraception counselling was provided in 79.2% and referral to another agency in 31.3% of EC consultations
Turnbull et al. (2020)[78]	Report on young women's experiences of accessing ECPs from pharmacies and sexual health clinics	UK (London)	Emergency contraception provision	Qualitative	Women aged 16–25 years, English speaking, and self-reporting at least one pregnancy scare or ECP use	• 21 participants were recruited from a young person's sexual health clinic (10), five pharmacies (6) and by snowballing (5) • Key advantages reported were ease and speed of access and convenience • Disadvantages included less personal service, not enough attention to information needs and to prevention of need for recurrence of EC, and unsupportive attitudes of pharmacy staff • Suggested improvements included increasing privacy, providing more advice on contraception, having a more empathetic approach and signposting follow-up services

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Michie et al. (2014)[79]	Determine the feasibility of pharmacy- based interventions to increase the uptake of effective contraception after EC	UK (Scotland)	Hormonal contraception provision or referral	Quantitative - cluster-randomized trial	Women ≥ 16 years of age	• Data collected from 11 pharmacies over 8-month • Pharmacies were randomized into standard care, 1-month progestogen-only pills (POP) provision, or rapid access (invitation to present the empty EC packet to a family planning clinic (FPC) for contraceptive advice) • 168 women were recruited, and 102 women (61%) were contacted 6–8 weeks later to determine contraceptive use: - 90% women used the pills provided in the POP arm - 32% women attended the FPC in the rapid access arm • The proportion of women using effective contraception at follow-up was significantly greater in both POP [56% (22/39), p=0.001] and rapid access [52% (13/25), p=0.006] groups compared to standard care [16% (5/31)]
Pregnancy						
Di Pietro et al. (2017)[80]	Describe the development and implementation of pre-conception care services with the use of TMR in three areas: 1) medications that may cause fetal harm, 2) folic acid, 3) immunizations	US (Ohio)	Counselling and education on pregnancy related topics	Quantitative	Female between 15-45 years of age members of the Medicaid plan	• 1,149 pharmacists from 818 different pharmacies completed at least 1 TMR in a 19-week period post implementation • 6,602 TMRs were acted on (33% of all TMR opportunities) with a 65% success rate • Needs patient education on (successful TMR): - Folic Acid supplement: 1,775 (65%) - Immunization (MMR/hep B): 971 (69%) - Category D/X medication use: 1,520 (62%)
Truong et al. (2019)[81]	Test the feasibility of a pharmacist consultation in early pregnancy and inform the design of a definitive trial	Norway	Education on pregnancy related topics	Quantitative - randomized control trial	Women ≥ 18 years of age in early pregnancy	• Over a 3-month period, 6 pharmacies participated • The median gestational age of participants at recruitment was 9 weeks • 28/35 participants had experienced at least one pregnancy-related ailment • The median duration of the interventions (n=11) was 15 minutes and seemed feasible

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						• Treatment of nausea and vomiting (10/11) and general information about medications (8/11) were frequently discussed • The women reported high satisfaction with the consultation (8/11)
Sexual dysfunction						
Morales et al. (2013)[82]	Assess pharmacists' ability to detect erectile dysfunction and encourage patients to seek medical evaluation	Spain and Greece	Screening, education and referral for erectile dysfunction	Quantitative	Men ≥ 18 years of age if history or medications indicated that they had a risk factor for ED and/or if they had consulted with a pharmacist about ED or ED treatments	• 25 pharmacists from Spain and 29 from Greece participated in the pilot • Among the 451 men (Spain=196 and Greece=255), 90% had a risk factor (usually hypertension, hypercholesterolemia, or diabetes) • The first health care professional approached by patients was a pharmacist (50%) • 348 (77%) men had a Sexual Health Inventory for Men score ≤21 • Less than one-third of men contacted for follow-up had visited their physician, despite pharmacist encouragement