Community Pharmacists' Roles in Sexual and Reproductive Health

by

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Abstract

Over the past two decades, considerable progress has been made in advancing the global agenda to ensure accessible and high-quality sexual and reproductive health (SRH) services for everyone. Legislative and policy changes have enabled pharmacists to expand their scope of practice to address different and new health challenges. Globally, the pharmacist's role is described as becoming more patient-oriented than it was years ago. Pharmacists' roles in SRH have evolved from primarily dispensing and counselling to delivery of extended services such as prevention and screening, prescribing, and referral to other SRH providers. The objective of this thesis was to determine community pharmacists' extended roles, practice experiences, and attitudes towards the provision of a wide range of SRH services. The first project, a scoping review of the literature, focused on synthesizing research that evaluated community pharmacists' delivery of SRH services. The second study aimed to explore community pharmacists' practices, attitudes, and self-reported confidence towards the provision of SRH services in Alberta, Canada.

The scoping review was completed by searching 6 databases and a grey literature web library from January 2007 to July 2020. After applying the eligibility criteria, 43 articles were included for analysis. Most studies were carried out in developed countries. Twenty-eight studies focused on sexually transmitted and blood-borne infections (STBBI), 12 on contraception, 2 in pregnancy, and 1 on sexual dysfunction. The main services provided by pharmacists were screening, prescribing, and provision of treatment through protocol or pharmacist only medications. Research included in the scoping review demonstrates that pharmacists' roles have extended beyond dispensing practices, supported by legislation, technology, and partnerships. Delivery of SRH services by community pharmacists was considered feasible, but most importantly, highly accepted and valued by users. However, a number of barriers need to be considered and addressed to position community pharmacists as SRH providers.

The second study was a cross-sectional web-based survey of community pharmacists practicing in Alberta (Canada) that explored practices, attitudes, perception of influencing factors, self-reported confidence in providing SRH education, and training preferences related to the provision of SRH services. In this study, the majority of participants reported currently dispensing medications and educating patients on several SRH topics. Participants were also providing initial prescribing, extension or renewal of prescriptions, and administering injections. Overall, participants had a positive attitude towards their role in providing SRH services. Participants' characteristics, such as gender, country of first pharmacy degree, additional prescribing authorization, and type of pharmacy, were found to be significant predictors of providing some extended services. In addition, the number of services provided and the country of first pharmacy degree were significant and independent predictors of overall confidence in providing SRH education. Most participants (84%) expressed interest in additional training related to at least one SRH topic; STBBI, sexual health concerns of lesbian, gay, bisexual, transgender, queer (or questioning) and others (LGBTQ+), and abortion medications were the most commonly selected. These were the same SRH topics that a higher number of participants reported to feel not at all confident in providing patient education.

The findings from both studies showed that community pharmacists are engaged in providing several traditional and extended SRH services. Inclusion of community pharmacists as SRH providers will help improve access within community settings. However, several challenges need to be addressed to implement pharmacy based SRH services and position community pharmacists as providers. This thesis highlights the opportunity to promote community pharmacists as members of the primary health care workforce to help address the SRH agenda.

Preface

This thesis is and original work by Javiera Constanza Navarrete Martínez.

Chapter 2 has been submitted for publication to the BMJ Open journal as "Navarrete J, Yuksel N, Schindel T.J, Hughes C.A. Sexual and Reproductive Health Services Provided by Community Pharmacists: A Scoping Review". I was responsible for conceptualization, analysis, and manuscript composition. Drs. Nese Yuksel and Theresa Schindel were involved with the analysis and manuscript review and editing. Dr. Christine Hughes was the supervisory and corresponding author; she contributed to conceptualization, investigation, analysis, and manuscript composition.

Chapter 3 of this research project received ethics approval from the University of Alberta Research Ethics Board – Health Panel, Pro00095881 "International comparison of community pharmacists' roles and attitudes in provision of sexual and reproductive health services", Jan 9, 2020.

Dedication

This work is dedicated to my family.

Egon, who taught me commitment and how to be a hard worker,

Mirna, who inspired me to pursue my dreams,

Paula, who shortened the long distance between us with nothing but love and care, and

Marcelo, who encourages me every day to learn, grow, and makes me smile even on the cloudiest days.

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Chapter 1. Introduction

1.1 Introduction

The right to the highest attainable standard of health is one of the thirty recognized human rights envisioned by the World Health Organization (WHO).[1] It specifies the right to an accessible health system that ensures protection and high-quality standards.[1] Within the right to health, sexual health and reproductive rights are included, and it is stated that everyone has the freedom and autonomy for their health and body.[2] According to the WHO, sexual health is defined as "a state of physical, mental and social well-being in relation to sexuality. It requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, and violence";[3] whereas reproductive health contemplates all matters regarding the functions and processes of the reproductive system.[4]

In 2015, the United Nations (UN) General Assembly adopted the Sustainable Development Goals (SDGs) as a universal call to action for the following 15 years, including a goal for health.[5,6] Sexual and reproductive health and rights (SRHR) are part of the targets that aim to ensure universal access to sexual and reproductive health (SRH) services by 2030.[7] After the promulgation of the SDGs, the regional WHO office for Europe declared improving SRH as a world health goal in 2016.[8] The committee proposed an action plan towards achieving the 2030 agenda for sustainable development, which emphasized that including SRHR into national strategies and planning should be considered a priority.[8]

In 2017, the WHO published a framework for an operational approach to sexual health, as relevant aspects can be overlooked when sexual health is fully grouped under reproductive health.[9] Sexual health and reproductive health are closely related but they cover different aspects of health; they enhance the impacts of each other to achieve a state of well-being. The framework has three

elemental components: the foundation of guidance principles, sexual and reproductive health interventions, and the climate of social-structural factors.[9] The scheme proposes six guiding principles that should be considered in the design, implementation, and evaluation of interventions.[9] Eight intervention areas, four for sexual health and four for reproductive health that complement each other, are described.[9] The social-structural factors include four dimensions to consider, in which sexual health and reproductive health are experienced by individuals, and where interventions are implemented.[9] This framework serves as the basis to achieve targets proposed by the SDGs, and more importantly to guide programs, interventions, and research in this area.[9]

Over the past two decades, considerable progress has been made in advancing the global agenda to ensure accessible and high-quality SRH services for everyone; however, this has been a largely uncoordinated effort.[10] Health inequalities and inequitable access is still an issue in developing and developed countries. Inequity remains within and between countries due to differences in health systems, laws and policies, education, as well as social norms and values. Vulnerable populations are at a higher risk of adverse health outcomes, and discrepancies in quality and effectiveness of SRH services they can access.[11,12] Significant health challenges include increased unsafe abortion, high mother and child mortality rates, as well as disproportionate rates of sexually transmitted infections (STI) and human immunodeficiency virus (HIV).[13] Integrating SRH into primary health care (PHC) seems like one of the best options for providing high-quality and effective SRH care, focusing on equity and rights for people.[14]

Primary health care is recognized as an integral part of health systems and aims to deliver health care that is accessible, equitable, and responsive to the health needs of people.[15] The PHC foundation aligns with the SDGs' universal access goal and the delivery of comprehensive and integrated SRH service.[14,16] A strong PHC system may reduce the reliance on professional care by supporting peoples' autonomy and responsibility for their health, thereby relieving burden on the

health system.[14,17] Integrating SRH into PHC provides two major benefits. First, despite the financial resource requirement, it may decrease health care expenses since it is more cost-effective than other alternatives.[17] Second, one of the PHC principles is patient-centeredness instead of disease-centerednes;[17] therefore, the SRH needs and preferences of people are considered. Some of the essential characteristics of SRH services incorporated into PHC are accessibility, affordability, comprehensiveness, integration, coordination, and health promotion and prevention.[16,17] However, the integration of SRH services does not translate into immediate success since lack of quality care and patients' out of pocket expenses still need to be considered as possible barriers.[14] PHC is not solely responsible for improving and promoting SRHR, and interventions for all SRH elements cannot be implemented at the PHC level.[14,17] Still, PHC may take the lead in delivering SRH services as the first entry-point to health care and play a coordinating role.[17]

1.2 Evolution of Pharmacist's Roles in Health Care

As stated in the joint International Pharmacists Federation (FIP) and the WHO guidelines on good pharmacy practice, community pharmacists are the most accessible health professional in charge of dispensing drugs and ensuring their safe and effective use.[18] Over the last half-century, the pharmacist's role as a health care provider has significantly grown and evolved.[19] During the 1950s, the pharmacist's role was limited to compounding, dispensing, and labelling pre-fabricated products chosen by a physician.[20] By the 1970s, novel literature supporting pharmacists' roles in primary care started to appear.[21] However, between 1990 and 2000, pharmacists became fundamental members of healthcare teams by improving patient outcomes through chronic disease prevention and management.[22] Community pharmacists play an essential role in the health care system as front-line health professionals.[23]

Globally, the pharmacist's role is described as becoming more patient-oriented than it was

years ago.[24,25] Increasingly, community pharmacists are involved in public health initiatives and serve as a link to other services in the community.[26] The convenient location of community pharmacies allows pharmacists to engage with several communities and promote access to healthcare services.[27-29] Legislative and policy changes have enabled pharmacists to expand their scope of practice to address different and new health challenges.[30,31] Coinciding with these changes, the community pharmacist's role has increasingly adopted a patient-centred perspective.[32] Based on the expansion of the existing scope of practice, services focused on personalized patient care and clinical decision-making are referred to as extended services.[32,33] These usually require additional education, training or demonstration of competence. [32,33] Some examples are medication reviews, prescribing, referrals, ordering and interpreting laboratory tests, and administration of injections.[32,34] Based on patient care evolution in pharmacy practice, some regions have also changed the pharmacy curriculum and certifications which supports pharmacists' roles as primary care providers.[34,35] North American, European, and Oceanian countries have replaced the Bachelor of Science in Pharmacy (BScPharm) program with a Doctor of Pharmacy (PharmD), a 6-year program focused on therapeutics and patient care.[22,36]

Reforms in the PHC system have been critical enablers to support the expansion of community pharmacists' patient-centred roles.[30,37] Countries worldwide have prioritized the development and upgrading of PHC due to its preventive, patient-centred, and responsible approach at the community level.[37-39] The role of pharmacists as part of PHC is to ensure the availability of a broad range of high-quality services, such as influenza vaccination and smoking cessation services, to improve the health of the community and reduce health inequalities.[37,38] The challenges to overcome when integrating community pharmacists into PHC include funding, workload management, additional training, and building strong relationships with the health care network.[30,37-39] Positioning community pharmacists within the primary care system gives them a

relevant role as contributors to PHC and collaborative patient care.[30]

Different approaches have been proposed to improve access to medications and services in PHC through community pharmacies, and changes in the scope of practice have contributed to these goals.[38-40] Some countries have granted prescribing authority for pharmacists, but prescribing models vary worldwide since they are implemented according to each jurisdiction's regulations.[41-43]. For example, in Canada pharmacists' prescribing authority varies between provinces. In 2007, Alberta enacted regulations allowing pharmacists to prescribe under 3 categories: emergency prescribing, adapting a prescription, and independent prescribing (also known as additional prescribing authorization or APA).[43] Pharmacists must submit an application to the Alberta College of Pharmacy to obtain APA, which is evaluated to determine if applicants meet the minimum standards.[44] Other provinces in Canada have adopted different models, such as minor ailments prescribing, to regulate pharmacist's ability to prescribe limited drugs.[43] Also, pharmacists are allowed to administer injections, including injectable contraceptives and vaccines, in countries like Canada, the United States (US), and the United Kingdom (UK).[45] In recent years, these non-dispensing services have been recognized by policymakers as part of pharmacists' roles in PHC, and several remuneration programs for patient care services have been implemented worldwide.[45]

Studies have shown that extended pharmacy-based services have the potential to improve patients' outcomes.[46] Pharmacists immunization programs have been shown to increase adult immunization rates,[47] and research has found that smoking cessation interventions delivered by community pharmacists are effective and cost-effective.[48] As pharmacies are available in most communities and in many cases, services are cost-effective, expansion of pharmacy-based services may be useful to address current and future health issues.[49]

1.3 Community Pharmacy and Sexual and Reproductive Health Services

International statistics show that although significant progress has been made in many SRH areas, more needs to be done at an accelerated pace.[50] There are still some 2030 SDGs unmet regarding access to contraception and safe abortion, unintended pregnancy rates, and STI incidence and prevalence.[51] Additionally, strengthening the PHC system by enhancing access to information, services, and opportunities in the health system is crucial for reaching future targets.[14] Community pharmacists are well-positioned to take on a more significant role in delivering a variety of SRH services as one of the most accessible and trusted health professionals.[52]

Community pharmacists currently have a role in the delivery of several SRH services.[53] Pharmacists' roles in SRH have evolved from primarily dispensing and counselling to offer prevention and screening services, as well as referral to other SRH providers.[53-56] In the literature, contraception and family planning are frequently reported as SRH areas pharmacists are engaged in. Some authors have described how important access to contraceptive methods through pharmacies is, considering their convenient locations and easy access.[55-58] The provision of EC, independent of its regulatory status, allows pharmacists to counsel not only about contraception but also other SRH issues, such as birth control, STI, and reproductive health.[59,60] Additionally, pharmacies are an important avenue for patients to receive timely counselling and referral to opt for safe and effective end of pregnancy options.[61] Raifman et al. argued that greater access and safety profiles are possible when medical abortion is provided at community pharmacies because more providers contribute to a higher positive impact on access.[62]

Although it is women who are primarily seeking contraception and family planning services, SRH services are needed for men as well. Morales et al. showed that in Spain, 60% of men with erectile dysfunction (ED) visited a pharmacist first for advice before going for clinical assessment.[63] They also found that pharmacists were accurate in detecting a high proportion of ED

cases.[63] Furthermore, STI affect both men and women, and are of great concern as the incidence and prevalence rates of several infections continue to increase worldwide.[64] The implementation of chlamydia screening services has been shown to be feasible in a community pharmacy setting.[65,66] Moreover, the literature review by Wood and Gudka found evidence supporting pharmacists' roles in screening of a number of STI, such as gonorrhea, chlamydia, hepatitis B, and HIV.[67] Pharmacy-based screening services have the potential to be effective in reducing STI prevalence and increasing prevention, considering that screening is one of the best ways to detect and treat these infections.[67]

Data suggests other healthcare professionals and patients support the provision of SRH services by pharmacists. Shah et al. found that the provision of HPV vaccination at pharmacies was supported by 79% of physicians and 81% of parents in the US.[68] Regarding STI, Gudka et al. reported that women attending pharmacies for EC considered a chlamydia screening service to be highly convenient.[69] Similarly, Gauly et al. reported that patients found contraception and STI services offered in community pharmacies accessible and convenient.[55] Individuals accessing the services in a pharmacy reported having a positive experience as they felt comfortable discussing their sexual health with a pharmacist.[55] Some authors have also studied community pharmacists' attitudes about the provision of specific SRH services. Hilverding et al. examined pharmacists' attitudes regarding contraceptive counselling and perceptions about SRH services in Ohio (US).[70] The results showed that pharmacists would like to be more involved in SRH services, such as HPV vaccination (67%) and STI partner therapy (64%), but at the same time, they reported that more training is needed to offer a broader range of these services.[70]

Community pharmacists need to continue expanding their knowledge and training to provide extended SRH services. Continuous training and education are crucial elements to provide high-quality services and prevent personal biases.[71] Gale and Watson described that Scottish

community pharmacists who provided SRH services were willing to receive more training in a variety of SRH topics to extend their roles.[53] Chaumont and Foster reported that pharmacists agreed with the need for continuous education about emergency contraception.[72] Lio et al. identified that learning needs and lack of comfort with hormonal contraception prescribing were attenuated after a training program.[73] Even though a low response rate[72,73] and samples representing specific regions[53,72,73] may limit the generalization of the results of these studies, findings suggest that additional training is needed to support community pharmacists' SRH roles, and support the idea that continuing professional development tools are crucial for success.[74]

Increasingly, societies are upholding the commitment to equity, diversity, and inclusion principles, and the services provided by pharmacists and other health providers need to reflect this commitment. For example, Maxwell et al. indicated that pharmacists have a relevant role when interacting with patients in the lesbian, gay, bisexual, transgender, queer or questioning, and others (LGBTQ+) community, which has been underserved by the health system for years.[65,75] They emphasized that a universal SRH approach should be included in university programs to build new skills and generate new cross-cultural competencies.[75] Since LGBTQ+ patients are at higher risk for STI and are more likely to avoid preventive care, community pharmacists are well-positioned to advocate for change and become trustworthy SRH providers.[75,76] Continued advancement in care delivery requires a more holistic view of SRH rights and addressing other issues, including diversity in gender identity and sexual orientation.[9,77]

Although authorities have recognized pharmacists' contributions, there are challenges to overcome when implementing community pharmacy-based SRH services.[28] Gomez et al. identified several barriers in implementing contraceptive prescribing services in independent pharmacies in California (US), including the time required to provide the service, concerns about patients seeking health care less frequently, and lack of financial incentives.[78] Similarly, a systematic review by

Wood and Gudka stated that even though STI screening is a suitable activity for pharmacists, economic, structural, and safety concerns are perceived barriers that should be considered before implementing a screening service.[67] These challenges have also been reported by other studies focused on a variety of extended SRH services provided by community pharmacists.[79-81]

In Canada, provincial and territorial governments have most of the responsibility for health care, and pharmacists' scope of practice differs in each province.[49,82] Pharmacists in the province of Alberta currently have the broadest scope of practice. In 2007, Alberta enacted legislation that allows pharmacists to administer drugs by injection and prescribe medications under different categories.[43] Since 2010, pharmacists can order laboratory tests in Alberta, and in 2012 the provincial government introduced a Compensation Plan for Pharmacy Services, further supporting the delivery of extended services.[83] However, despite community pharmacists having a broad range of services to offer, there are few studies in Alberta addressing their role in SRH as providers of extended services.

In summary, community pharmacists are increasingly providing SRH services to the community, and the community pharmacy is a suitable setting to contribute to the SRH agenda. Providing SRH services through pharmacies can improve access and contribute to the provision of high-quality services. Despite the evidence supporting pharmacists' involvement in the provision of SRH services, research has focused on specific SRH areas. Few studies describe practice, attitudes, confidence and training preferences of community pharmacists regarding the full spectrum of SRH services. In order to understand community pharmacists' roles in SRH, further research is required to describe the type of services and SRH topics that are part of community pharmacists' practice. Also, exploring attitudes, self-confidence, and additional training preferences towards providing a wide range of SRH services may contribute to filling this gap.

1.4 Objective

The purpose of this thesis is to determine community pharmacists' extended roles, practice experiences, and attitudes towards the provision of a wide range of SRH services. Two projects were conducted to explore pharmacists' roles in the delivery of SRH services.

The first project focused on synthesizing research that evaluated community pharmacists' delivery of SRH services. This project was a scoping review of the literature aimed at identifying the SRH areas as well as the extended services provided by community pharmacists. The second project was a quantitative study designed to explore community pharmacists' practices, attitudes, and self-reported confidence towards the provision of SRH services in Alberta, Canada. We also explored factors associated with pharmacists' confidence in providing SRH education to patients and delivery of extended SRH services. In this study, we used a web-based survey as a measurement instrument, which was developed by the research team and underwent validity testing.

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Chapter 2. Scoping Review

Sexual and Reproductive Health Services Provided by Community Pharmacists: A Scoping Review

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Abstract

Objectives: This scoping review aims to identify and synthesize research that reported community pharmacists' extended services across a broad range of SRH areas. The specific objectives are to describe and categorize the SRH areas and examine what extended services were provided by community pharmacists.

Methods: A scoping review was performed using the framework by Arksey and O'Malley and reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol extension for Scoping Reviews (PRISMA-ScR). Six electronic databases and ProQuest were searched to identify relevant literature published between January 2007 and July 2020. Articles reporting community pharmacists' roles, the delivery of pharmacy based SRH services and individuals' acceptance, uptake or other outcomes related to the service were included. Two investigators independently screened titles and abstracts and one charted the data. Articles were grouped and analyzed by key SRH themes uncovered in the review.

Results: Of 6,559 articles screened, 43 met the inclusion criteria. Most studies were carried out in developed countries. Twenty-eight studies focused on sexually transmitted and blood-borne infections, 12 on contraception, 2 in pregnancy, and 1 on sexual dysfunction. The main services provided by pharmacists in these studies were screening, prescribing, and provision of treatment through protocol or pharmacist only medications.

Conclusion: Community pharmacists can play an important role in enhancing access to SRH services. Research demonstrates that pharmacists' roles have extended beyond dispensing practices, supported by legislation, technology, and partnerships. Still, to position these services as sustainable and affordable for communities, a number of barriers need to be considered and addressed. Exploring other SRH areas and the provision of a full spectrum of SRH services is needed to enhance and position community pharmacists' roles in SRH.

2.1 Introduction

Sexual and reproductive health (SRH) is recognized 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 that focused on ensuring high-quality SRH services are accessible to everyone.[2] However, inequity remains within and between countries due to differences in health systems, laws and policies, education, as well as social norms and values.[2] The far-reaching impact of unsafe abortions, unintended pregnancies, reproductive cancers, human immunodeficiency virus (HIV), and other sexually transmitted infections (STI) on countries' health and socioeconomic development cannot be overemphasized. Community pharmacists are well-positioned to take on a more significant role in delivery of SRH services as one of the most accessible and trusted health professionals. The convenient location of pharmacies allows pharmacists to provide SRH services and engage with underserved communities.[3,4] The expanded scope and patient-oriented shift in pharmacists' practice has potentiated their public health role.[5,6] This evolution provides the opportunity to address the burden on the primary health care system and poor accessibility, especially in SRH. Access issues have exacerbated during the COVID-19 pandemic, and pharmacists may be critical in emergency responses. Even though community pharmacy practice has evolved, continued advancement requires a more holistic view of SRH and consideration of issues, such as adolescent sexuality, diversity in gender identity and sexual orientation, and SRH stigma.[2,7]

Regulatory frameworks and legislative policies have facilitated direct access to SRH services through community pharmacies in many countries. As an example, early in the 21st century, non-prescription progestin-only emergency contraception was made available through pharmacies in various European countries, followed by Canada, New Zealand, and Australia.[8,9] Pharmacists can prescribe hormonal contraception in several Canadian provinces and jurisdictions

in the United States (US).[10,11] Pharmacists are also authorized to administer injections in many parts of the world, including Canada, the US, United Kingdom (UK), Australia, and New Zealand.[12] These examples highlight the recognition by policy makers of the expanded role pharmacists can play, including the delivery of SRH services.

To better understand community pharmacist's involvement in SRH services, some reviews have explored specific areas, such as the supply of emergency contraception,[8] medical abortion provision,[13] roles in HIV prevention,[14] and STI screening.[15] Other researchers have focused on pharmacists' and users' knowledge, attitudes and experiences related to certain SRH services.[16-20] A recent systematic review of experiences and attitudes related to SRH services reported that services were accessible and convenient for users, and the provision was considered feasible by the pharmacy staff.[21] Although research in this area has increased in recent years, there is no literature evaluating the extended (patient-centred) roles of community pharmacists in SRH areas. Therefore, this review aimed to address this gap by identifying and synthesizing research that reported community pharmacists' extended services across a broad range of SRH areas. The specific objectives of this scoping review were to (1) describe and categorize SRH areas, and (2) examine what non-dispensing services were provided by community pharmacists.

2.2 Methods

2.2.1 Study Design

This scoping review was conducted according to the methodological framework recommended by Arksey and O'Malley and enhanced by Levac et al.,[22,23] and is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol extension for Scoping Reviews (PRISMA-ScR).[24] There was not a protocol developed a-priori and this review has not been registered/published anywhere.

A scoping review is a useful knowledge synthesis tool to map relevant evidence about a topic of interest.[23] In contrast to systematic reviews, scoping reviews include different study designs, address a broad research question, and typically do not critically assess the quality of the evidence.[23] Therefore, a scoping review of the literature on this topic was beneficial for two main reasons. First, it allowed inclusion of research with varying study designs, participants, and outcomes.[23] Second, it was possible to capture more literature about the topic since there were no quality standards for inclusion.[24] Scoping reviews' framework and methodology are an excellent option for exploring SRH services offered by community pharmacies, community pharmacists' roles in providing these services, and identifying knowledge gaps within the existing literature. The following stages were employed: (1) identifying the research question. (2) identifying relevant studies, (3) study selection, (4) charting the data and (5) collecting, summarizing, and reporting the results.[22,23]

2.2.2 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 January 1, 2007 to July 22, 2020. The timeframe for inclusion was determined based on the publication dates of previous reviews in this field, and the scope of pharmacist practice and policy changes worldwide that have impacted current practice.

Keywords included: pharmacists, community pharmacy services, sexual health, sexually transmitted disease* or sexually transmitted infection* or STD* or STI or STIs, prescriptions, screening, patient education, service. The full Medline (Ovid) search strategy is available in Appendix A. The articles were retrieved from each database and imported into EndNote (v.9, Clarivate Analytics) for management and de-duplication, then exported to Excel (v. 16.39, Microsoft) for screening.

2.2.3 Screening Stage and Eligibility Criteria

Study selection focused on peer-reviewed literature that evaluated community pharmacists' delivery of SRH services. To be included, studies had to report individuals' acceptance, uptake or other outcomes related to the service. Articles were excluded through the screening process if they did not report any outcome related to the service or users, if the setting was not a community pharmacy, if a community pharmacist did not provide the service, if the outcomes reported were only about pharmacists' experience or attitudes about the service, or if the research was incomplete or yet to be published (e.g., conference abstracts). Research evaluating dispensing practices only were excluded. Abstracts, protocols, reviews, letters, and commentaries were also excluded. Eligibility criteria was established and then refined during initial screening (Table 2.1).

The articles were screened in two phases. Two investigators (JN and CH) screened titles and abstracts independently to identify articles that met the inclusion and exclusion criteria. Full articles were obtained in the event that the abstract did not provide enough information. Both investigators (JN and CH) reviewed the full text of articles that were identified as potentially relevant. Discrepancies about study eligibility were discussed until consensus was reached

2.2.4 Data Extraction and Synthesis

A data extraction tool was developed in Excel (v. 16.39, Microsoft) to record the following information for each article: study details (authors, title, journal, year, and country), study characteristics (objectives, research method, study design, SRH area, study period, and data collection method) population (target population for SRH service, number of participants, and number of pharmacies/pharmacists), intervention (service provided), primary outcome, results, and conclusions. Data were extracted by JN and reviewed by a second investigator for accuracy (NY, TS, or CH).

A descriptive analysis including a numerical overview of the amount, type, and distribution of included papers was performed. A narrative synthesis was used to fulfill the study objectives. Articles were grouped and synthetized by key themes or SRH areas uncovered in the scoping review. Characteristics of studies and key findings were summarized, and comparisons made between studies.

2.3 Results

2.3.1 Study Selection

The initial search yielded 6,559 results after the removal of duplicates (Figure 2.1). After screening titles and abstracts, 77 articles were retrieved for full-text review. From these, 43 articles met the inclusion criteria and were included. Reasons for exclusion of articles at the different stages are provided in Figure 2.1. We excluded a total of 34 studies which were of potential relevance but due either to ineligible service (13 studies), results (8 studies), service provider (5 studies setting), outcome (4 studies), (3 studies), or study design (1 study) were ineligible for inclusion (Table 2.2).

2.3.2 Study Characteristics

The characteristics of studies included are summarized in Table 2.3. In terms of research study design, nearly 70% of studies were quantitative (non-randomized), two were cluster randomized, and one was a randomized controlled trial. Mixed methods were used in approximately 20% of studies, and one study was qualitative.

Most of the studies included in the review were carried out in the US (n=20) or UK (n=13). Twenty-eight (65%) studies focused on sexually transmitted and blood-borne infections (STBBI), 12 (28%) on contraception, 2 (5%) on pregnancy, and 1 (2%) on sexual dysfunction. The most common SRH activities performed by pharmacists were screening (37%), prescribing (16%), and provision of treatment through protocol or pharmacist only medications (14%); other activities included administration of injections, education and counselling, screening and treatment, and referral. More than two-thirds of studies (70%) were published between 2015 and 2020. Figure 2.2 shows the number of the articles included by year of publication, for the SRH areas identified in this review.

2.3.3 Main Findings

Studies were categorized into four main SRH areas: sexually transmitted and blood-borne infections, contraception, pregnancy, and sexual dysfunction. An overview of these studies is summarized in Table 2.4 and described in further detail below.

2.3.3.1 Sexually Transmitted and Blood-Borne Infections (STBBI)

Twenty-eight studies evaluated STBBI services provided by community pharmacists; 9 (32%) were *Chlamydia trachomatis* (CT) related, 9 (32%) were focused on human immunodeficiency virus (HIV), 5 (18%) on human papillomavirus (HPV), and 5 (18%) on hepatitis C virus (HCV).

2.3.3.1.1 Chlamydia

Four of the 9 studies evaluated pharmacists' involvement in chlamydia screening,[25-28] two evaluated screening and treatment services,[29,30] and three evaluated treatment services.[31-33] Screening for CT was offered through the distribution of chlamydia test kits,[25,27,29] or by the collection of urine samples that were stored at the pharmacy and shipped to a pathology provider for analysis.[26,28] In one study, it was not clear how screening was performed.[30] Two studies implemented the distribution of test kits to women requesting emergency contraception.[25,27] Of the studies which evaluated treatment services only, two focused on the treatment of partners,[31,33] and one focused on the treatment of index cases.[32]

In terms of studies that assessed chlamydia screening, the target population and sample size varied considerably (Table 2.4). Studies that used the home test kits reported 18% and 28% of samples returned for testing.[25,27] In comparison, one study offered on-site screening (collection of samples) with an incentive for participants and pharmacists.[26] In this study, 75% of unique samples were returned to the pharmacy.[26] Positivity rates reported for chlamydia ranged from 0% to 9.5%.[25-27,29,30] Studies focused on treatment services used vouchers that could be redeemed for free chlamydia treatment at participating community pharmacies. Cameron et al. found 40% of the treatment vouchers were redeemed by partners of index cases in a median of 2 days after being issued.[31] Slutsker et al. reported similar results; 41% of vouchers were redeemed even when the medication was free of charge.[33] Another study used the same methodology but for index cases with uncomplicated CT and found that 87% of vouchers were redeemed in a median of 1 day.[32]

Overall, users reported a high level of satisfaction with the services provided.[27,28,30,31] Convenience,[27,28,30] location,[28] short waiting times and no appointments needed,[27,28,30,31] and a non-judgmental approach[30] were reported as benefits. Barriers or challenges were also noted, including

users' low awareness of service,[25,27] concerns regarding confidentiality and privacy,[27,28,30] and in some cases, inconvenience of returning specimens to designated pharmacies or laboratories.[25,27]

2.3.3.1.2 HIV

Of the 9 studies focused on HIV, one evaluated pharmacist-led pre-exposure prophylaxis (PrEP),[34] one focused on pharmacist's involvement in monitoring adherence/adverse drug reaction for dispensed antiretrovirals,[35] one on referral of young adults for HIV screening,[36] and the remainder on HIV screening at the community pharmacy.[37-42]

Havens et al. implemented a pilot whereby individuals started on HIV PrEP could choose to be followed by a community pharmacist for ongoing STI/HIV screening and PrEP prescribing.[34] Although the authors described logistical challenges related to STI screening, results indicated that implementing a pharmacist-led PrEP program was feasible and achieved high satisfaction rates among participants.[34] Two studies were conducted in Africa.[35,36] One focused on ongoing antiretroviral medication supply and monitoring devolved from health facilities to community pharmacies,[35] and the other on pharmacist referral for HIV screening in individuals with possible symptoms of acute HIV infection.[36] Avong et al. reported 100% prescription refill rate and high retention in care, concluding that the model was feasible.[35] Mugo et al. found that about one-quarter of individuals that met acute HIV targeting criteria were screened for HIV at the study clinic, and 4% of those tested had a reactive test result, suggesting that pharmacy referrals based on targeted criteria may be useful to identify undiagnosed individuals.[36]

The studies reporting HIV screening in community pharmacies varied in terms of duration, the number of tests performed, as well as whether screening was offered as part of a pilot or an established program (Table 2). Most studies used rapid point-of-care testing (POCT) with finger-prick blood samples for screening,[37,39,40,42] and one used oral fluid samples.[41] Five studies reported

referral and confirmatory testing for individuals with reactive results.[37,39-42] The authors reported 0.8%,[37,42] 0.9%,[40] and 1.6%[41] of HIV rapid tests performed were reactive. Fernández-Balbuena et al. reported findings from three programs in Spain involving 110 pharmacies and found that community pharmacy testing contributed to identifying 10% of new HIV cases in the region; a high percentage of heterosexual men were tested.[40]

Studies that focused on HIV screening demonstrated that pharmacists are capable of reaching high-risk groups and individuals not previously tested.[37-42] For example, persons tested included low income and minority groups,[37,38] and individuals at moderate or very high risk of HIV infection.[41,42] Crawford et al. evaluated uptake of HIV testing when part of comprehensive disease screening implementation in low-access and minority communities.[38] Fernández-Balbuena et al. and Kelly 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).[40,42]

Some studies reported positive experiences with HIV screening at community pharmacies.[39,42] However, challenges in providing HIV-screening services were also reported, including recruitment and advertising,[39,41,42] obtaining the sample,[39,42] integration into the daily workflow,[42] pharmacists' remuneration,[39,42] costs,[41] and referral and linkage to care.[37] 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.[34]

2.3.3.1.3 HPV

Five studies explored pharmacy-based services focused on HPV vaccination. Two studies evaluated the implementation of HPV vaccination services at community pharmacies,[43,44] two studies focused on educational strategies and impact on vaccination rates,[45,46] and one study focused on a patient assistance program for university students and vaccination uptake.[47] Three

studies targeted adolescents and/or younger adults,[43,46,47] one study targeted individuals between 9 and 26 years old filling acne or birth control prescriptions at the pharmacy,[45] and one did not specify the target group (Table 2.4).[44]

HPV vaccination service was offered directly through the pharmacy,[43,45-47] or by a health clinic that promoted a community pharmacy as an alternate setting to complete the vaccination series.[44] Regarding service promotion, different strategies were described. The efforts reported by 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, vaccination education handouts, roadside signs, and direct patient approach.[43] Other authors described similar strategies to reach potential participants, with direct patient approach most commonly used.[44-47]

From the studies evaluating educational strategies, pharmacists used HPV related educational sessions and materials to approach individuals.[45,46] Navarrete et al. assessed knowledge and attitudes of university students towards HPV prior to implementing the service.[47] Seventy-two percent of students did not understand how HPV was transmitted, and 87% were unclear whether the vaccine was indicated for adults.[47]

There were, however, important barriers reported in these studies. Some authors mentioned payer reimbursement and insurance coverage as the main obstacles for individuals to receive HPV vaccination from pharmacies.[43,45,47] In some states in the US, pharmacies are not included as qualified vaccine provider sites for vaccinating age-eligible adolescents.[43] As a consequence, this limits the reach to young people and the integration of the service into primary care systems.[43] Parental beliefs about vaccination,[44,46,47] awareness of pharmacists' immunization training,[43] and information about available services[43,47] were also challenges reported.

2.3.3.1.4 Hepatitis C

All five studies focused on HCV screening services in community pharmacies.[48-52] In one study, pharmacists performed HCV-antibody (Ab) rapid POCT,[50] and in four studies dried blood spot testing (DBST) was used.[48,49,51,52] 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.[49] Two other studies reported testing samples for HCV, HBV and HIV.[51,52] Studies also included additional pharmacists services, such as pre- and post-test counselling,[48-52] provision of results face-to-face,[48] treatment dispensing,[52] and referral to link patients to care.[50-52]

The screening services in these studies aimed to reach primarily high-risk groups, including individuals attending for needle exchange,[49] opiate substitution therapy,[49,51,52] and those with limited access to care.[50] The percentage of tests performed that were reactive was reported to be 1.2%,[50] 7%,[48,49] and 25%.[51] As part of the service, pharmacists consulted or referred patients with reactive tests to specialist care.[48-52] Buchanan et al. implemented in 22 pharmacies a "point-of-diagnosis" consultation with the community pharmacist and a hepatologist for individuals with confirmed HCV infection.[49] In the study by Dong et al., the only individual with a reactive rapid POCT refused referral for linkage to confirmatory testing and care during the study; however, 45 tests were performed from which six were reactive and linked to care after the pilot period.[50] Pharmacist services extended beyond screening to support patients' care following diagnosis. Buchanan et al. reported that all patients remained actively engaged in care, and some of them started HCV treatment during the study period.[48,49] Radley et al. reported that 51% of patients started treatment upon reactive results when they followed the pharmacist-led pathway for HCV.[52]

Challenges implementing HCV screening services included motivating people to get tested,[50] careful time-management by pharmacists to balance workload,[48,50,51] and pharmacists' compensation for the service.[50]

2.3.3.2 Contraception

Of the twelve studies focused on contraception, eight evaluated hormonal contraceptive services.[53-60] In terms of pharmacists' services, six studies assessed prescribing hormonal contraception,[53-55,57-59] one study evaluated an educational intervention provided by community pharmacists,[61] three focused on injectable contraceptive administration,[60,62,63] and two on emergency contraception (EC) provision.[56,64]

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.[53,55,57-59] Anderson et al. found that community pharmacists in Oregon issued 10% of new contraceptive prescriptions (oral or transdermal methods) during 2016-2017.[53] In addition, Lu et al. reported that trained pharmacists in Oregon and California prescribed different contraceptive methods, including oral (95.7%), patch (1.6%), vaginal ring (2.6%) and injectable (0.1%).[55] However, Gibbs and Harvey assessed the impact of this type of policy in Oregon during the first two years following implementation and concluded there was no significant increase in contraceptive use.[59] 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.[59]

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.[58] Pharmacists may also enhance access to contraceptive and SRH services through referral to other healthcare professionals and clinics for further care.[54,56,61,63] Mantzourani et al. noted that 31% of EC consultations included a referral to a sexual health clinic or a general practitioner.[56] Monastersky Maderas and Landau found that pharmacy and clinic

partnerships to expand access to injectable contraception resulted in reciprocal referrals since they referred to each other for STI screening and EC provision.[63] Michie et al. concluded that referral by pharmacists to a health clinic and pharmacists' provision of progestogen-only contraceptive pill were valuable and could increase the uptake of effective contraception after EC.[61]

Compared with other contraceptive methods, injectable contraceptives require more visits to clinics, which may be inconvenient for some individuals.[62,63] Pharmacists can assist women by administering injectable contraceptives at the time of picking up their refill.[62,63] Heller et al. suggested that a pharmacy-based injection for users of subcutaneous injectable contraceptives may be feasible, but the public viewed pharmacist availability as a barrier for access.[62] Some investigators explored the potential of this service in partnership with a clinic. Picardo and Ferreri[60] randomized women to receive follow-up injections at a pharmacy or clinic,[60] and Monastersky Maderas and Landau[63] gave women the option to continue receiving the injections at the clinic or a community pharmacy[63]. Monastersky Maderas and Landau described that pharmacies, which successfully organized and integrated the service into their workflow, reported that 50% of women returned for the service more than once.[63] Convenient access to community pharmacies made this service feasible with high acceptance rates by women.[60,62,63]

Community pharmacies provide an important option for women to access EC.[56,64] Community pharmacists contribute to reducing teenage conception and termination rates as they increased access to EC.[56] 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.[56] Turnbull et al. showed that users of over the counter (OTC) EC preferred pharmacy-based EC for the ease and speed of access and convenience. [64] Disadvantages included less personalized service by the pharmacist and subsequent need for EC.[64] Women in this study suggested enhancements including increased privacy and consultation to expand pharmacists' role in the provision of contraception.[64]

2.3.3.3 Pregnancy

Two studies addressed pregnancy and preconception care.[65,66] One of these studies tested the feasibility of a pharmacist consultation in early pregnancy.[66] The women reported high satisfaction rates, emphasizing the importance of a telephone consultation.[66] The majority would recommend the service to other pregnant women.[66] DiPietro Mager et al. demonstrated that pharmacists could provide targeted medication reviews (TMR) to provide preconception education including folic acid use, medications that may cause fetal harm, and recommended vaccines in pregnancy.[65] This study found that community pharmacists rapidly integrated the TMR process and that a sustainable reimbursement model was feasible.[65]

2.3.3.4 Sexual Dysfunction

One study assessed pharmacists' ability to detect erectile dysfunction (ED) and encourage individuals to seek medical advice.[67] Community pharmacists were often the first contact within the healthcare system for patients at high-risk of ED and could accurately detect ED.[67] The results showed that 90% of men included in the study had a risk factor for ED, and 77% had ED.[67] The authors concluded that pharmacists' roles in detecting, evaluating, and motivating individuals to be evaluated by a physician need to be assessed by future research.[67]

2.4 Discussion

The aim of this review was to synthesize research reporting community pharmacists' roles in providing SRH services. Most studies identified were in the areas of STBBI and contraception. During the study period, the vast majority of research was conducted in developed countries, primarily the US and UK, which may be partly explained by regulatory and legislative policies enacted over the past 15 years to support increased access to SRH services. Community pharmacists were involved in a wide range of activities beyond dispensing, reflecting the opportunity for pharmacists to play a more significant role in delivery of SRH services.

Based on the results of this review, non-dispensing services provided by community pharmacists included screening and/or treatment of STBBI (particularly CT, HIV, and HCV), prescribing HIV PrEP or hormonal contraception, administering HPV vaccine or injectable contraceptives, providing emergency contraception and CT treatment, counselling and education on pregnancy-related needs, and screening and referral for erectile dysfunction. Services were frequently aimed at younger adults and in some cases women. In some instances, SRH services (e.g., chlamydia screening) were offered to women accessing other pharmacy services, such as emergency contraception.[25,27] Delivery of SRH services by community pharmacists were determined to be feasible,[29,34,35,39,41,50,54,60,63,65,66] but most importantly, highly accepted and valued by users.[27,28,30,31,34,39,42,54,57,62,66]

Generally, studies included in this review found provision of SRH services by community pharmacists enhanced access to care, users' experiences, and the uptake of services. Advantages of community pharmacies included the location,[28,50,51,57,62] extended opening hours,[34,45,62] short waiting times and no appointments necessary,[27,28,30,34,45,57,62,64] anonymity,[42] and the continuous presence of friendly healthcare professionals with a non-judgmental approach.[27,30,34,42] These results are similar to what has previously been reported in the literature. In a systematic review,

Chirewa and Wakhisi found that young women considered provision of EC through community pharmacies in the UK to be convenient and easy to access.[68] Convenience was an important factor when deciding where to receive healthcare services.[68] In addition, a non-judgmental approach, services that were free, private and confidential, and the experience of receiving services from helpful pharmacists were considerations when choosing pharmacies over other settings. 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.[21] However, with respect to individuals' views on privacy, Gauly et al. noted some patients appreciated the level of privacy provided while others expressed concerns about being overheard when talking to the pharmacist.[21]

Community pharmacy SRH services reached new contraceptive users,[53,59] people who have not been tested before for STBBI,[51,52] and hard-to-reach or high-risk populations.[34,38-40,42,48-52] These findings highlight the reach of community pharmacies' to vulnerable populations that often face additional barriers to accessing SRH services. Gonsalves and Hindin found that the availability of SRH services through pharmacies appealed to and were used by young people, who often face financial, social or cultural barriers to accessing services in the community.[69] Community pharmacies have been described as a healthcare "hub",[70] and opportunities exist to promote and integrate SRH services, along with other services, to underserved or vulnerable populations.

Legislative changes, availability of technology for screening and sample collection, and partnerships were important enablers that supported the delivery of extended SRH services in community pharmacies. For example, some studies in this review evaluated pharmacy access of hormonal contraceptives and progestin-only EC pill, which is available as a result of approved legislation in some states in the US.[71,72] Advances in POCT, DBST, and home collection test kits technologies enabled pharmacists to offer screening services for HIV, HCV, and chlamydia outside

traditional settings.[73] Benefits of this type of service provided at pharmacies are that some samples can be self-collected,[27] the sample collection is non- or minimally invasive,[74] and a pharmacy is usually more conveniently located than a clinical testing site.[74,75] Care delivery models, including partnerships with hospitals, sexual health clinics, and physicians[35,44,47,60,63] as well as collaborative practice agreements[34,43,46] were reported as successful implementations.

The studies included in this scoping review identified several barriers to SRH service provision by community pharmacists. Integration of services into the daily workflow,[42,44,51] pharmacists' remuneration for SRH services,[34,42,48-50] cost and reimbursement for patients,[34,40,41,47] and policy regulations[46] are some of the commonly reported challenges to expanded SRH care services in pharmacies. The introduction of new policy approaches to boost and enhance community pharmacists' roles in SRH is still needed. For example, pharmacists are authorized to administer injections in all states 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.[43,46] In addition, parents' and patients' awareness of pharmacists' training and services,[25,27,33,39,41,42,47] concerns about pharmacists providing safe and high-quality services,[54] and motivation to opt into the services (e.g., voluntarily ask for any STBBI screening service)[25,27,50] are some of other challenges to overcome. In order for SRH services through pharmacies to be sustainable and affordable, addressing these barriers are paramount.

In this review, most studies focused on a small number of SRH services and were conducted primarily in developed countries. None of the studies identified in our search evaluated pharmacist delivery of SRH services that address patient needs in the areas of medical abortion, the long-acting reversible contraceptives (LARC) intrauterine contraceptive devices and subdermal implants, vaccine education and delivery in pregnant women (e.g., Tdap), nutritional advice in pregnant

women, and screening and treatment for other STI, such as gonorrhea and syphilis. Studies on community pharmacy delivery of SRH services to lesbian, gay, bisexual, transgender, queer/questioning (LGBTQ) individuals in the community, who may face health disparities particularly related to SRH,[76] were not found. These gaps identified may be due in part to the search dates and inclusion criteria for this review. However, these gaps highlight opportunities for future research to examine pharmacists' roles in other SRH areas and tailored to other populations, delivery of integrated SRH services, as well as care delivery models that incorporate telemedicine. In addition, research evaluating services offered in developed and developing countries, as well as use of other study designs are needed.

In many parts of the world, the COVID-19 pandemic has dramatically impacted public health, and sexual and reproductive health and rights are no exception. The pandemic has had repercussions on routine and preventive SRH services, shortage of products and supplies, and service delivery capacity.[77-79] This situation is likely to impact the most vulnerable populations disproportionately.[77,80,81] Still, the COVID-19 pandemic also presents an opportunity to consider new models and supports needed for person-centered care delivery in the community.[77] Community pharmacists are ideally situated to provide SRH services, such as contraception,[82,83] medical abortion,[84] and STBBI treatment and prevention,[85] during this time as well as in the future to better serve the needs of the public.

2.4.1 Strengths and Limitations

Strengths of this scoping review include the comprehensive search strategy developed with the assistance of a professional librarian, the use of a methodological framework and PRISMA-ScR guidelines, and the inclusion of a wide range of study designs and SRH areas. However, it is essential to note the limitations of this review as well. Only peer reviewed literature was included,

and eligibility was restricted to studies of real patients or pharmacy users. Some studies exploring this topic used mystery clients or simulated patients to evaluate community pharmacists' SRH services. Thus, excluding these studies may have resulted in the omission of SRH services delivered by community pharmacists. Another issue encountered was the variability in reporting results and details across studies.

2.5 Conclusion

Community pharmacists can play an important role in enhancing access to SRH services and this may be the case particularly in the post-COVID-19 era. Research demonstrates that pharmacists' roles have extended beyond dispensing practice, and include screening of STBBI, prescribing contraception and HIV PrEP, and administering HPV vaccine and injectable hormonal contraception. Published studies on community pharmacists' roles in SRH is gaining momentum. Still, to position community pharmacists as sustainable and affordable providers of these services in communities worldwide, a number of barriers need to be addressed including remuneration for these services. Based on identified gaps, future research is needed to examine pharmacist-delivery of SRH services in areas such as medical abortion, LARC therapy, vaccine delivery in pregnant women, and screening and treatment of other STI, such as gonorrhea and syphilis. Implementation and evaluation of integrated SRH services delivered by community pharmacists that meet the needs of specific populations, is needed.

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Figure 2.1 PRISMA-ScR Flow chart

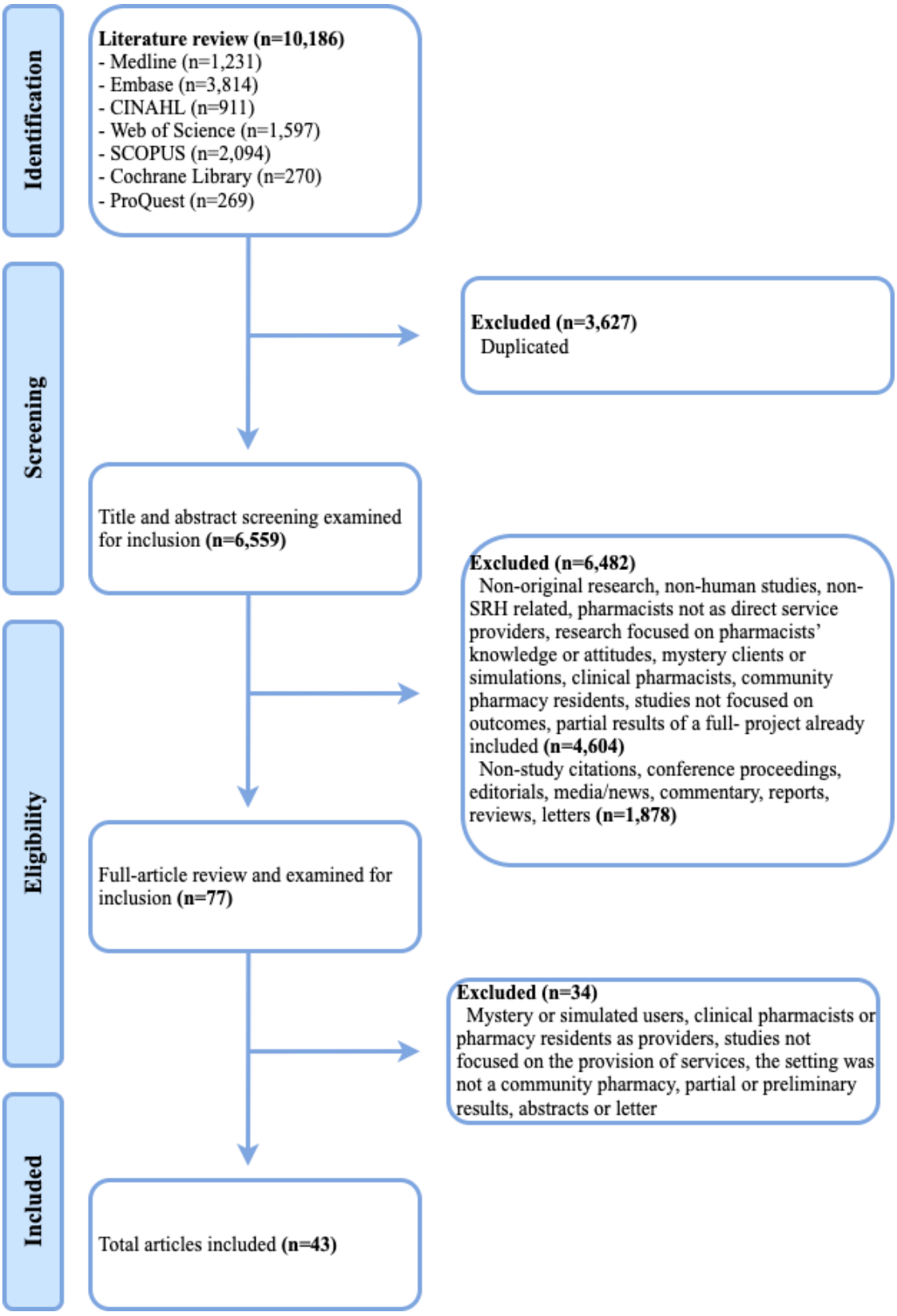
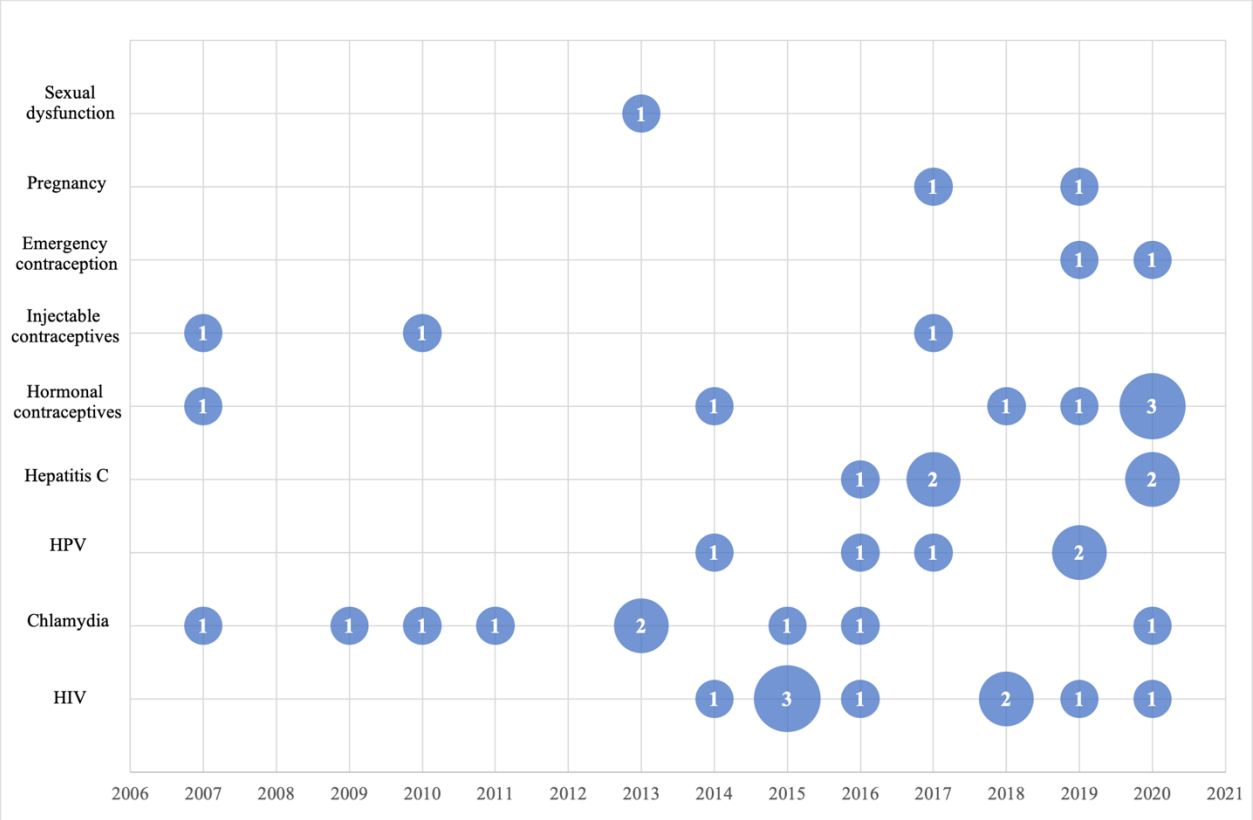


Figure 2.2 Systematic map – SRH topic and year of publication



Area of points are proportional to absolute values of number of studies

HPV Human papilloma virus, *HIV* Human immunodeficiency virus

Table 2.1 Eligibility Criteria

Aspects of study design	**Eligibility criteria**
Population	People of all ages from any country
Intervention	Community-pharmacy based services focused on sexual and reproductive health
Outcome	Any outcome related to the service provided for real patients/users. Mystery clients or simulated patients were excluded
Setting	Community pharmacy; not specialized pharmacy or pharmacy based in a hospital/clinic
Provider	Community pharmacists had to participate in the provision of the service directly; not clinical pharmacists or residents
Study design	Qualitative, mixed methods, and quantitative. Descriptive studies (retrospective, cross-sectional or prospective), comparative and non-comparative studies were included; Commentaries, editorials, opinions, protocols, meta-analysis and reviews were excluded.
Year	Articles published after 2007
Language	No language restrictions

Table 2.2 Articles excluded after full-text screening

Study	Reason
Agardha et. al (2017)[86]	Intervention inappropriate: Focused on patients' opinions regarding an SRH topic not on the description of services provided
Akour et al. (2018)[87]	Provider inappropriate: Pharmacy resident involved in distribution of booklets
Albassam & Awad (2018)[88]	Intervention inappropriate: Focused on evaluation of pharmacists' knowledge not on the description of services provided
Alucema et al. (2015)[89]	Intervention inappropriate: Focused on educational strategies to increase the knowledge only about menopause
Amesty et al. (2015)[90]	Results inappropriate: Partial results (full-text article was an abstract)
Chandrasekhar et. al (2018)[91]	Setting inappropriate: group counseling sessions and classes provided in a rural area. It does not specify that those were conducted in a community pharmacy
Dabrera et. al (2011)[92]	Intervention inappropriate: Focused on challenges faced by pharmacists not on the description of services provided
Debattista et la. (2017)[93]	Intervention inappropriate: Community pharmacy considered as distributor/sale center for kits, it is not focused on services provided by community pharmacists
Emmerton et al. (2011)[94]	Results inappropriate: Partial results (full-text article was an abstract)
Fernández-Balbuena et. al (2015)[95]	Results inappropriate: Partial results of another study published (Fernandez-Balbuena et. al (2015))
Gonsalves et. al (2019)[96]	Intervention inappropriate: Broad perspective of pharmacists' roles in the area, it is not focused on the description of services provided
Gonsalves et. al (2020)[97]	Outcome inappropriate: Results from mystery shoppers
Gonsalves et. al (2020)[98]	Intervention inappropriate: No description of extended services, focused on dispensing practice
Gorostiza et. al (2013)[99]	Results inappropriate: Partial results of another study published (Fernandez-Balbuena et. al (2015))
Gouveia et al. (2019)[100]	Results inappropriate: Partial results (full-text article was an abstract)
Isho et. al (2017)[101]	Provider inappropriate: Pharmacy resident

Kugelmas et. al (2017)[102]	Provider inappropriate: A phlebotomist obtained consent from participants and performed the testing
Llayton et al. (2020)[103]	Provider inappropriate: A postgraduate pharmacy resident led the HCV screening protocol
Lecher et. al (2015)[104]	Setting inappropriate: Inclusion of clinics and community pharmacies (independent and retail), but there are no results/analysis for community pharmacies only. It also focused on cost-analysis
Lopez et. al (2020)[105]	Results inappropriate: Preliminary results of a study
Marlin et al. (2014)[106]	Intervention inappropriate: It involves pharmacists, but it is not the focus of the study
Martin et al. (2020)[107]	Results inappropriate: Partial results (full-text article was an abstract)
Mugo et. al (2017)[108]	Provider inappropriate: Research assistant were responsible for consenting, counselling and data collection. Community pharmacists were responsible for participant recruitment only.
Parsons et. al (2013)[109]	Outcome inappropriate: Results from mystery shoppers
Payne (2020)[110]	Study design inappropriate: Full text was a letter
Rodriguez et al. (2016)[111]	Intervention inappropriate: Not focused on the provision of the new service, focused on the legal changes
Rodriguez et. al (2019)[112]	Intervention inappropriate: Not focused on community pharmacists as provider of an extended service – Cost analysis
Rogers et. al (2019)[113]	Intervention inappropriate: Not a regulated service by law. Illegal availability of mifepristone and misoprostol at pharmacies for end of pregnancy purposes
Stone et. al (2020)[72]	Outcome inappropriate: Results from Mystery caller
Tung et al. (2018)[114]	Results inappropriate: Partial results (full-text article was an abstract)
Walsh et. al (2019)[115]	Setting inappropriate: Not a regular community pharmacy; it restricted the type of patients they served
Willetts et. al (2018)[116]	Intervention inappropriate: Not focused on community pharmacists as provider of an extended service
Wong et. al (2017)[117]	Intervention inappropriate: Focused on pharmacists' experiences
Young et. al (2009)[118]	Outcome inappropriate: Results from simulated users

Table 2.3 Summary of Study Characteristics

Characteristics	Studies n (%)
Region	
United States	20 (47.0)
United Kingdom	13 (30.2)
Australia	3 (7.0)
Canada	1 (2.3)
Nigeria	1 (2.3)
Spain	1 (2.3)
Greece and Spain	1 (2.3)
Puerto Rico	1 (2.3)
Kenya	1 (2.3)
Norway	1 (2.3)
Research design	
Quantitative (non-randomized)	29 (67.4)
Quantitative cluster randomized trial	2 (4.7)
Quantitative randomized controlled trial	2 (4.7)
Mixed methods	9 (20.9)
Qualitative	1 (2.3)
SRH area	
STBBI	28 (65.1)
Chlamydia	9 (32.1)
HIV	9 (32.1)
HPV	5 (17.9)
Hepatitis C	5 (17.9)
Contraception	12 (28.0)
Hormonal contraceptives	7 (58.3)
Injectable contraceptives	3 (25.0)
Emergency contraception	2 (16.7)
Pregnancy	2 (4.7)
Sexual dysfunction	1 (2.3)
Main pharmacists' activity	
Screening	16 (37.2)
Prescribing	7 (16.3)
Provision of medication	6 (14.0)
Medication treatment through protocol	4 (66.7)
Pharmacists only medication	2 (33.3)
Injection administration	6 (14.0)
HPV vaccine	3 (50.0)
Injectable contraceptives	3 (50.0)
Education and counselling	5 (11.6)
Screening and treatment	2 (4.7)
Referral	1 (2.3)

SRH Sexual and reproductive health, *STBBI* Sexually transmitted and blood-borne infections, *HPV* Human papilloma virus, *HIV* Human immunodeficiency virus

Table 2.4 Peer reviewed articles included

Primary author and year of publication	Objective/s (to)	Study location	Pharmacists' main activity	Category of study design	Target population for pharmacists' SRH service	Study summary
Sexually transmitted and Blood-borne infections (STBBI)						
Anderson et al. (2011)[29]	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)[30]	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 · Clients valued convenience and speed, non-judgmental approach

Brabin et al. (2009)[25]	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: - 1348/2904 (46.4%) women accepted chlamydia testing kit - 236/1341 (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)
Cameron et al. (2010)[31]	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
Currie et al. (2013)[26]	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)[27]	Develop and measure the effectiveness and acceptability of a pharmacy-based	Australia (Perth)	Chlamydia screening	Mixed methods	Asymptomatic women ≥18 years requesting	· 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

	chlamydia screening intervention				emergency contraception	· 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 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
McClure et al. (2016)[32]	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
Parker et al. (2015)[28]	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 were 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

Slutsker et al. (2020)[33]	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
Avong et al. (2018)[35]	Determine the rate of prescription refill and retention in care/loss-to-follow-up	Nigeria (Abuja)	HIV education and counselling (adherence and adverse drug reaction monitoring)	Quantitative	Stable adult patients on first-line ART with no comorbidities	· 295 participants were referred within the 12 months review period · About 10% of patients treated for HIV/AIDS at 8 public health facilities were devolved to 10 community pharmacies · Prescriptions refill rate was 100% 99.3% retention in care
Collins et al. (2018)[37]	Describe the HIV testing program and summarize its outcomes	US (Virginia)	HIV screening	Quantitative	Individuals ≥ 18 years of age	· 32 stores involved in testing –3630 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)[38]	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
Darin et al. (2015)[39]	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

Havens et al. (2019)[34]	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 · 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
Fernandez-Balbuena et al. (2015)[40]	Assess the feasibility and the main outcomes of three programs for HIV	Spain (Basque Country, Castilla y León, Catalonia)	HIV screening	Quantitative	Individuals ≥ 16 years of age	· 24,151 people got tested at 110 pharmacies in three programs in different regions of Spain, 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

Kelly et al. (2020)[42]	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
Mugo et al. (2015)[36]	Evaluate the success of pharmacy referrals and uptake of HIV testing by pharmacy clients	Kenya (Mtwapa)	Referral for HIV screening	Quantitative	Individuals between 18-29 years of age	· Over 6-month period at 5 pharmacies, 1,490 individuals met acute HIV infection targeting criteria · 1,074 (72.1%) accepted a referral coupon 353 (24%) were screened for HIV-1 at a study clinic · 14 (4%) of those tested were HIV positive · 43 (13%) had never been tested before · Uptake of testing varied significantly by the referring pharmacy and was higher for those who went to pharmacy without a prescription and those with STI symptoms

Weidle et al. (2014)[41]	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
Calo et al. (2019)[43]	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)[44]	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
Hohmeier et al. (2016)[45]	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 a 8-week period · 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)[46]	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 · 24/79 reported being previously vaccinated for HPV · 4/79 patients received HPV vaccination during the study period

Navarrete et al. (2014)[47]	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
Buchanan et al. (2016)[49]	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	Not specified	· 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

Buchanan et al. (2020)[48]	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
Dong et al. (2017)[50]	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)
Radley et al. (2017)[51]	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)[52]	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 (1365 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 1365 vs 145 [11%] of 1353, 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
Contraception						

Anderson et al. (2019)[53]	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 · 367/3614 (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)[54]	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 a 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

Gibbs & Harvey (2020)[59]	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
Lu et al. (2019)[55]	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%)

Michie et al. (2014)[61]	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)]
Rodriguez et al. (2020)[57]	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)[58]	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<.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)
Heller et al. (2017)[62]	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 & Cohen (2007)[63]	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 Ferreri (2010)[60]	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 a clinic or a community pharmacy · 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 the pharmacy as a clinical site (≥89%). · Continuation rates and patient satisfaction with the contraceptive method and the pharmacy setting were comparable to those who attended a family planning clinic

Mantzourani et al. (2019)[56]	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)[64]	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

Pregnancy						
Di Pietro et al. (2017)[65]	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	· 1149 pharmacists from 818 different pharmacies completed at least 1 TMR in a 19-week period post implementation · 6602 TMRs were acted on (33% of all TMR opportunities) with a 65% success rate · Needs patient education on (successful TMR): - Folic Acid supplement: 1775 (65%) - Immunization (MMR/hep B): 971 (69%) - Category D/X medication use: 1520 (62%)
Truong et al. (2019)[66]	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 · 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						

(Continued)

Morales et al. (2013)[67]	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

Chapter 3. Research Project

Community Pharmacists' Roles in Sexual and Reproductive Health: Practices and Attitudes Toward the Provision of Services

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Abstract

Objectives: The primary objective was to explore Alberta community pharmacists' practices and attitudes towards the provision of sexual and reproductive health (SRH) services. Secondary objectives were to examine self-reported confidence in providing SRH education, additional training preferences, as well as factors influencing pharmacists' confidence and delivery of extended SRH services.

Methods: This was a cross-sectional web-based survey of community pharmacists. An email invitation to complete the survey was sent to practicing pharmacists in Alberta (Canada). The survey was open for an 8-week period between June and August 2020. Summary statistics, and univariate and multivariate regression were used for the analyses.

Results: A total of 303 responses were analyzed. Sixty-six percent of participants were female, 67% had additional prescribing authorization (APA), and 97% had injections authorization. The majority of participants reported providing patient education on several SRH topics. Almost all participants (99%) reported extending prescriptions for combined hormonal contraceptives. Of those with APA, 40% reported currently providing initial prescribing services for combined hormonal contraceptives. At least 90% of participants with injections authorization reported administering injectable contraceptives and human papilloma virus (HPV) vaccine. Most participants (93%) agreed that offering advice on SRH is an essential part of their role. However, self-reported confidence in providing patient education varied depending on the SRH topic. The number of services provided and the country of first pharmacy degree were significant and independent predictors of overall confidence in providing SRH education. Most participants (84%) expressed interest in additional training related to at least one SRH topic.

Conclusion: Based on our results, community pharmacists in Alberta are engaged in providing several SRH services and overall, have a positive attitude towards their SRH role. Preliminary data suggest that there is opportunity to expand pharmacists' roles in SRH. Future research is needed to understand more in-depth why pharmacists are not providing SRH services and how to support the adoption of extended services.

3.1 Introduction

In the last two decades, the World Health Organization (WHO) has advocated for including sexual and reproductive health (SRH) as a world health goal, emphasizing that SRH is an integral part of individuals' overall health and services should be accessible for everyone.[1] Although progress has been made towards providing accessible and high-quality SRH care,[2] services are often not implemented on a large scale or integrated into the healthcare system as part of a comprehensive approach, and in many cases fail to reach vulnerable or marginalized groups.[3] Recent global estimates suggest more than 40% of pregnancies were unintended,[4] and there were 376 million new curable sexually transmitted infections (STI) in 2016, including chlamydia, gonorrhoea, syphilis, and trichomoniasis.[5] Global targets for addressing the SRH agenda will not be reached despite the availability of expanded options for services within health systems.[6]

Integrating SRH services into primary health care (PHC) may increase access, reduce inequities, and improve quality.[6-9] One of the roles of PHC in SRH includes strengthening the capacity and knowledge of health care professionals to provide quality services to men and women throughout their lifespan.[7] The delivery of high-quality SRH services requires the means of delivering these services as well as a competent workforce. In 2011, the WHO outlined desirable SRH core competencies for primary care providers, including attitudes, knowledge, ethical principles, leadership, ability to work in and with the community, and clinical skills.[10] Well-prepared primary care providers are able to meet patients' needs and go beyond established standards of care.[11]

Community pharmacists play an important role in PHC as front-line providers.[12,13] Pharmacists are well positioned to participate in multidisciplinary collaborative teams[14,15] and engage with underserved communities.[16,17] Over the last half-century, the pharmacist's role as a

health care provider has significantly grown and evolved.[18] Traditional pharmacists' roles include dispensing medications and counselling patients,[17] while services focused on personalized patient care and clinical decision making are extended.[17,19] Legislative and policy changes have supported pharmacists' extended roles, and this improves access to SRH services.[20] In some countries community pharmacists are allowed to prescribe hormonal contraception,[21] administer human papilloma virus (HPV) vaccines and injectable contraceptives,[22] educate and provide medications for the end of pregnancy,[23,24] and offer screening for sexually transmitted and blood-borne infections (STBBI).[25]

Pharmacy practice in this field has evolved; however, there is limited research exploring community pharmacists' practices and attitudes regarding a full spectrum of SRH services. Most of the available studies examining practices have focused on specific SRH areas, such as hormonal contraception,[26] emergency contraception,[27] and chlamydia screening.[28] Studies to date addressing community pharmacists' confidence and professional development or training needs have also focused on specific topics. Research suggests that community pharmacists would like to access professional learning opportunities on HPV vaccine,[29] human immunodeficiency virus (HIV) screening,[30] pregnant and lactating women education and counselling,[31] and transgender care.[32] Similarly, Gale and Watson showed that community pharmacists in Grampian, Scotland were interested in additional training to expand their SRH roles since they provided only a limited range of SRH services.[33]

In Canada, provincial and territorial governments have most of the responsibility for health care, and pharmacists' scope of practice differs in each province.[34,35] As a result of new regulations and policies, in some Canadian jurisdictions pharmacists have an important role in minor ailments prescribing.[36] For example, in Saskatchewan, pharmacists are allowed to prescribe minor ailments,

such as emergency contraception, erectile dysfunction, and hormonal contraception.[37] By comparison, in 2007 Alberta enacted legislation that allows pharmacists to extend their services to administer drugs by injection and prescribe medications.[38] The prescribing model in Alberta includes emergency prescribing, adapting or extending a prescription, and independent prescribing (also known as additional prescribing authorization or APA).[38] All pharmacists in Alberta are able to adapt or extend prescriptions, however only those pharmacists that apply for and receive APA can prescribe Schedule I drugs.[39,40] Medications and vaccines commonly used as part of SRH services, such as contraceptives, erectile dysfunction medication, and human papilloma virus (HPV) vaccine, are included in the Schedule I category of drugs.

Following legislative changes research in Alberta has explored pharmacists' prescribing role,[38,41] the positioning of pharmacists' roles in PHC,[13] community pharmacists perceived roles,[42,43] and learning needs in this new practice era.[44] However, community pharmacists' practice, attitudes, confidence, and additional training preferences in the SRH field have not been fully explored. The regulatory framework and expanded scope of pharmacist practice provides opportunities to understand current practices, as well as interest and support needed to further advance delivery of a wide range of SRH services.

The primary objective of this study was to explore Alberta community pharmacists' practices and attitudes towards the provision of SRH services. Secondary objectives were to determine self-reported confidence in providing SRH education, additional training preferences, as well as examine factors influencing pharmacists' overall confidence in providing SRH education and delivery of extended SRH services. This research is part of a larger study looking at community pharmacists' practices and attitudes towards the provision of SRH services in Canada, Japan, and Thailand.

3.2 Methods

3.2.1 Study Design and Participants

This study was a cross-sectional, web-based survey of community pharmacists practicing in Alberta, Canada. This study received approval from the University of Alberta Health Research Ethics Board (Pro00095881) (Appendix B). Analyses and reporting of results were conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline for cross-sectional studies.[45]

Data collection (and management) was conducted using an online survey via Research Electronic Data Capture (REDCap). All of the information that was collected was kept confidential and was anonymous. An email invitation with a link to the online survey was sent to all pharmacists on the clinical register of the Alberta College of Pharmacy who agreed to share their contact information for research purposes. An information letter and consent were included at the beginning of the survey; completion of the survey and submission of responses implied participants' consent (Appendix C). A screening question was used at the beginning of the survey to identify community pharmacists. Only pharmacists that selected that they worked in a community pharmacy were directed to continue the survey. The survey was open for an eight-week period between June and August 2020, with reminder emails sent at weeks 3, 4, and 6. As an incentive, participants were offered the opportunity to enter a draw to win a $100 gift card (odds of winning estimated to be 1 in 10).

3.2.2 Survey Instrument

The instrument was developed in several stages. A literature review was conducted to inform the content of the questionnaire. Questions related to pharmacists' practices and attitudes were adapted from a questionnaire developed by Gale and Watson.[33] The WHO sexual and

reproductive health core competencies in primary care document was used to inform questions related to additional training.[10] The survey instrument was developed by the research team considering the scope of pharmacists' practice in the province of Alberta. Validity testing consisted of expert review of the survey instrument (n=2), and one-on-one cognitive interviews with pharmacists via Zoom (V. 5.0.5) (n=5), which entailed thinking out loud while they answered the survey. In addition, the survey was piloted using the REDCap platform with community pharmacists in Alberta (n=11). After each stage, formatting, content, and wording were revised as needed.

The survey instrument was divided into 7 sections, including: (1) participants' characteristics, (2) provision of SRH services, (3) attitudes toward SRH services, (4) factors that influence community pharmacy SRH services, (5) self-reported confidence in providing SRH education, (6) additional training preferences related to SRH, and (7) education and practice background. The survey covered 8 SRH topics: pregnancy tests, ovulation tests, contraception (non-hormonal and hormonal), emergency contraception, abortion, sexually and blood-borne transmitted infections (STBBI), maternal and perinatal health, and general sexual health. Each topic consisted of close-ended questions; sections 1, 2, 6, and 7 consisted of simple and multiple checklists, and 5-point Likert-type scales were used in sections 3, 4, and 5. An open-ended question at the end of each section was included to capture more detailed information. The survey instrument can be found in Appendix D.

3.2.3 Bias

In order to minimize response bias, survey responses were anonymous and neutral language was used as much as possible when designing the survey instrument. Strategies previously described in the literature to reduce non-response bias and improve response rates, such as

increasing the number of days the survey was open, sending an invitation and reminder emails, and including an incentive were used.[46,47]

3.2.4 Study Size

There was no sample size set a priori. Based on previous survey response rates of studies conducted in Alberta (~10%),[42,48] and an estimated 4,000 community pharmacists in the province, we anticipated there would be 350-400 respondents.

3.2.5 Variables

The primary outcomes were the number of community pharmacists currently providing traditional and extended SRH services, the number of pharmacists planning to provide those services in the future, and the proportion of participants agreeing with several statements about pharmacists' SRH roles. We asked participants if they were currently providing several traditional and extended SRH services. If the answer was no, they proceeded to answer if they were planning (or not, do not know) to provide the service in the future. Using a 5-point Likert-type scale, we asked participants how strongly they agreed or disagreed with statements regarding pharmacists as SRH providers, and to what extent different factors affected the provision of SRH services.

Secondary outcomes included the proportion of participants reporting confidence in providing SRH education across different SRH topics, and preferences for additional training in this area. First, we asked about willingness to expand their role in SRH and interest in additional training opportunities. For those who answered yes, we asked about their preferences in terms of knowledge and competencies. In addition, we assessed predictors of two extended services, initial prescribing and administration of injections, and overall confidence in providing SRH education. All participants characteristics were tested. The number of services provided was considered as a potential confounder of overall confidence in providing SRH education.

We collected participants' characteristics, such as demographics, pharmacy education, authorizations, and characteristics of their workplace. Demographic data included gender and age. Pharmacy education included their highest degree in pharmacy as well as country where they completed their first pharmacy degree (within or outside Canada) and level of education. Years of registration as a pharmacist, and additional authorizations, such as injections and APA, were also captured. Pharmacy characteristics included type of pharmacy and location (e.g., urban or rural). All participants' characteristics were classified as categorical variables.

3.2.6 Statistical Analysis

Descriptive statistics, such as frequencies (reported as percentages), were used to analyze pharmacists' characteristics, attitudes, factors influencing the provision of SRH services, as well as self-reported confidence and additional training preferences. Median and interquartile range were used to report Likert-type scale results.

For the analysis of factors influencing the provision of two extended services, initial prescribing and administration of injections, we used as our sample participants who indicated they have APA and injections authorization, respectively. This decision was made because APA and injections authorization are designations that are required for providing initial prescribing services and administering injections, respectively. In this study, not all pharmacists who reported providing extended services indicated they had these authorizations. For that reason, we performed sub-group analysis for predictors of the provision of initial prescribing and administration of injections.

When evaluating predictors associated with overall confidence in providing SRH education, the confidence scores of each of the 18 SRH topics were assigned per participant and then summed for an overall total confidence score (continuous variable); we scored "not confident at all =1" and

"very confident = 5". All potential predictors were independently analyzed to determine if there were possible confounding variables.

Univariate logistic regression sub-group analysis was performed to assess potential predictors of initial prescribing by pharmacists with APA and administration of injections by pharmacists with injections authorization. Multiple linear regression was conducted for the same purpose for overall self-reported confidence score for providing SRH education.

Prior to conducting the exploratory factor analysis, preliminary screening was conducted in SAS v.9.4 (SAS Institute Inc. Cary, NC, US). Univariate level analysis was conducted by univariate logistic/linear regression to indicate whether there existed statistically significant association between the dependent variables and independent variables, and to quantify the impact of the independent variable on dependent variables by coefficient (S.E) (95% Confidence Interval), odds ratio (95% Confidence Interval), and *p*-values. Specifically, the relationship between (1) pharmacists' characteristics and current provision of extended SRH services, (2) pharmacists' characteristics and overall total confidence score in providing education SRH, and (3) current provision of extended SRH services and the overall total confidence score in providing SRH education were studied. Statically significant variables based on the regression analysis and clinically significant variables selected by the research team were included in the multivariate level analysis by multivariate linear regression model of confidence score. The *p*-value for statistical significance was set at 0.05. Analysis was performed using R v.3.4.0 (Vienna, Austria; https://www.r-project.org/) and SAS v.9.4 (SAS Institute Inc. Cary, NC, US).

3.3 Results

3.3.1 Characteristics of Participants

The email invitation with a link was sent to 5,349 pharmacists on the Alberta College of Pharmacy's clinical register. A total of 401 pharmacists attempted the survey, of whom 303 (75.6%) were included in the analysis. Of the 98 individuals not included, 44 indicated they did not practice in a community pharmacy and 54 did not submit their responses.

The participants' characteristics are presented in Table 3.1. Approximately two-thirds of participants were female, and about 80% reported that their highest degree was a Bachelor of Pharmacy. Most pharmacists indicated they had injections authorization (97%), a practitioner identification number to order laboratory values (PracID) (74%), and APA (67%). Over half of participants worked in a large urban area and approximately 20% worked in medium or small urban areas.

3.3.2 Current and Future Provision of SRH Services

When asked about the availability of SRH products and services (Figure 3.1), at least three-quarters of participants reported that the following products or services were available at the pharmacy where they worked: antibiotic or antiviral treatment for patients with confirmed STBBI, emergency contraception pills, pregnancy tests, HPV vaccine, barrier contraceptives for men, and ovulation tests. Less than half of pharmacists reported that, abortion medications, and barrier contraceptives for women were available at their workplace, and 6% reported the availability of point of care testing for HIV or hepatitis C virus (HCV) (Figure 3.1).

Table 3.2 outlines the number of pharmacists providing the services out of the total sample (n varied between 300 and 303). Regarding contraception, the majority of participants reported currently providing traditional services, such as dispensing various forms of contraception. Most

participants also reported educating patients on combined hormonal contraceptives (97%), progestin-only pill (96%), injectable contraceptives (94%), levonorgestrel and copper intrauterine devices (IUDs) (90% and 85%, respectively), and emergency contraception (98%). While 38% of participants reported that they were currently dispensing abortion medications, of those who were not dispensing abortion medications, 31% (58/187) answered "do not know" and 43% (80/187) answered "no" to planning to provide it in the future.

Participants indicated they were currently providing extended services related to contraception, mainly extending prescriptions for hormonal contraceptives (99%), progestin-only pills (96%), and injectable contraceptives (90%). Regarding initial prescribing of contraception, about 41% of pharmacists with APA provided initial prescribing for hormonal contraception (81/201), 35% for progestin-only pills (71/201), 24% injectable contraceptives (49/201), 9% levonorgestrel-IUD (17/201), and 5% cooper-IUD (10/201). Around 35% of participants who reported not providing initial prescribing services for hormonal contraceptives, progestin-only pill, and injectable contraceptives indicated that they were planning to provide them in the future. Over 40% of those not providing initial prescribing services related to contraception indicated they "do not know" if they were planning to provide in the future.

In this study, 13% of pharmacists with APA (26/201) provided initial prescribing for a STBBI, primarily for gonorrhea and chlamydia. Of those not providing initial prescribing for a STBBI, nearly half (133/276) answered they did not know about any plans to provide in the future. About 94% of participants with injections authorization reported that they currently administer the HPV vaccine in their practice. Forty-five percent of pharmacists reported dispensing HIV pre-exposure prophylaxis (PrEP) medications, while 25% (42/167) of those who were not currently providing the service indicated they planned to provide it in the future.

More than 90% of participants responded that they were currently providing maternal and perinatal health services, such as education and provision of information on the safety of medications in pregnancy or breastfeeding. A high percentage (86%) of pharmacists with injections authorization also reported administering recommended vaccines in pregnancy. About one-third of pharmacists (34%) reported helping female patients identify/select options for sexual dysfunction, whereas more than two-thirds (68%) reported providing help to identify options for sexual dysfunction for male patients (Table 3.2).

According to pharmacists' perceptions, the most commonly demanded services by patients were hormonal contraceptives (95%), emergency contraception (77%), and injectable hormonal contraceptive (63%) services (Table 3.3).

3.3.3 Attitudes and Factors that Influence the Provision of SRH Services

About 90% of participants strongly agreed or agreed that offering advice on SRH is an essential part of community pharmacists' roles (93%) and that they had an ethical responsibility as pharmacists to provide SRH services (89%). Sixty-eight percent (206/303) strongly agreed or agreed that pharmacists were adequately trained to provide SRH advice. Eighty percent of pharmacists did not have religious or moral objections to providing some SRH services (Table 3.4).

Regarding factors that may influence the provision of SRH services, nearly all participants indicated pharmacy staffing (91%), the time required to provide the services (88%), and pharmacists' knowledge (86%) as the main factors that "somewhat impact the service" or "impact the services to a great extent" (Table 3.5).

3.3.4 Confidence Levels and Additional Training Preferences

Over half of participants felt very confident providing SRH education in the following areas: hormonal contraceptives (63%), injectable contraceptives (60%), emergency contraception

(59%), pregnancy test (57%), and barrier contraception for men (52%). More than 10% indicated they were not confident at all regarding STBBI prevention (12%), female sexual dysfunction (13%), and abortion medications (16%). More than one-quarter of participants reported feeling not confident at all about educating on sexual health concerns of lesbian, gay, bisexual, transgender, queer or questioning, and others (LGBTQ+) (26%) and STBBI testing (38%) (Table 3.6).

About 70% of participants indicated an interest in expanding their roles in SRH, and 84% expressed interest in additional SRH training. Of the 254 pharmacists interested in additional training, approximately half preferred more training for practice in the areas of STBBI (treatment, prevention, and testing), sexual health concerns of LGBTQ+ patients, and abortion medications (Table 3.7). In terms of core SRH competencies, less than a half of participants reported interest in additional training related to confidentiality and privacy (29%) and approaching individuals in a nonjudgmental manner (39%). In comparison, more than 50% reported interest in additional training related to health history recompilation focused on SRH. About two-thirds or more of participants identified additional training on providing referrals, using appropriate and straightforward language when counselling, and recognizing individual needs when providing education and counselling as their main preferences (Table 3.8).

3.3.5 Factors Influencing Confidence and Delivery of Extended SRH Services

Table 3.9 shows the results of the multivariate regression analysis for overall self-reported confidence in providing SRH education. The number of services provided (b=0.85, $p < 0.0001$) and Canadian school for first pharmacy degree (b=4.68, $p < 0.05$) were found to be significant predictors and positively related to overall self-reported confidence scores. Even though not all age categories showed statistical significance as predictors, results indicated that older pharmacists (≥ 51 years) were more likely to report themselves as more confident than younger pharmacists

(b=4.05, $p < 0.05$). Appendix E shows the univariate regression analysis used to select potential predictor in the multiple regression analysis.

Tables 3.10 and 3.11 show findings from the univariate regression sub-group analysis for extended SRH services, initial prescribing (by pharmacists with APA) and administration of injections (by pharmacists with injections authorization), respectively. Varied trends were observed when analyzing for predictors of extended services. Gender was found to be a predictor of current provision of initial prescribing services for all contraceptive methods. Female pharmacists were less likely to provide initial prescribing for contraception than male pharmacists ($p < 0.05$). Canadian school for first pharmacy degree was a positive predictor for some services. Pharmacists who completed their first pharmacy degree in Canada were more likely to provide initial prescribing for combined hormonal contraceptives (OR=2.02, 95%CI (1.08-3.80), $p < 0.05$), progestin-only pills (OR=1.99, 95% CI (1.05-3.77), $p < 0.05$) injectable contraceptives (OR=2.31, 95% CI (1.16-4.57), $p < 0.05$), and STBBI (OR=2.63, 95%CI (1.12-6.14), $p < 0.05$) than pharmacists who completed their degree outside of Canada. APA was a positive predictor for administering injections (Table 3.11). Pharmacists working at corporate/chain pharmacies were more likely to provide injectable contraceptives (OR=2.51, 95% CI (1.05-6.06), $p < 0.05$), HPV vaccine (OR=2.90, 95%CI (1.04-8.42), $p < 0.05$) and recommended vaccines in pregnancy (OR=2.37, 95%CI (1.11-5.05), $p < 0.05$) than pharmacists working at independent pharmacies.

3.4 Discussion

This study explored community pharmacists' practices and attitudes towards providing SRH services in Alberta, the province with the broadest scope of practice in Canada.[35] Self-reported confidence in providing SRH education, additional training preferences, as well as factors

influencing pharmacists' overall self-reported confidence in providing SRH education and delivery of extended SRH services were also examined.

Overall, participants were involved in providing traditional SRH services, such as dispensing medication, patient education, and providing information. However, traditional services less commonly reported were dispensing the abortion pill and HIV PrEP. Even though the abortion pill (mifepristone/misoprostol) can be dispensed directly to patients by a pharmacist in Canada since 2017,[49] more than 60% of participants indicated that they do not dispense it and only one-quarter of those reported planning to provide it in the future. Other studies have shown that abortion medication access could be partially influenced by moral and social convictions regarding abortion and sexual health that can influence abortion medication access.[50,51] In terms of HIV PrEP, more than half of participants reported not dispensing it currently in their practice even though HIV PrEP has been publicly funded in Alberta since 2018 for individuals at risk of HIV.[52] Low uptake of PrEP has been widely reported in the literature related to a number of individual and systemic barriers including low self-perceived HIV risk, unwillingness to use PrEP, access to PrEP providers, and stigma in healthcare settings.[53,54] While it is not possible to explain why pharmacists are not dispensing these medications based on our survey results, it may be at least partially related to patients accessing providers for these SRH services.

Participants in this study frequently reported providing extended services, particularly extending or renewing contraceptive prescriptions. This is perhaps not surprising as all pharmacists in Alberta can extend or renew prescriptions, while only pharmacists with APA can initiate prescriptions. In contrast to earlier findings of research conducted in Alberta, we found a higher percentage of participants reporting having APA and providing initial prescriptions.[41] The uptake of APA and initial prescribing is likely multifactorial, however it may be partly influenced by

implementation of a compensation plan in Alberta for pharmacy services that includes prescribing services. In this study, pharmacists with APA reported providing initial prescribing services for all contraceptives, with combined hormonal contraception the most commonly reported and IUDs the least commonly provided. It is possible that pharmacists are not prescribing IUDs as much as oral or injectable contraceptives as IUDs require another health care provider for insertion. Interestingly, of those who did not report providing initial prescribing for contraceptive methods, more than 40% indicated they "do not know" about plans for the future. This suggests an opportunity for future studies to assess strategies to support community pharmacists to take the next step in providing extended services in SRH.

The findings from this research adds to existing literature reporting early experiences of pharmacist prescribing of contraception. It is difficult to compare our results to previous research on contraceptive prescribing services as regulations vary between and within countries,[22,26] and this study focuses specifically on SRH related prescribing. Following new legislation allowing pharmacists to prescribe hormonal contraception in California and Oregon, the first states in the United States (US) in enacting these regulations,[55] a study showed that pharmacists prescribed various hormonal contraceptives, with oral contraceptives being the most common,[26] which is consistent with our results. Nevertheless, slow adoption of pharmacists prescribing of contraception has been described.[56] A telephone audit study in California found that the service was available in only 11% of pharmacies.[57]

Another key finding is the number of factors associated with initial prescribing services. We found that male participants with APA were more likely to provide initial prescribing services for all contraceptive methods than female participants with APA. Rodriguez et al. assessed pharmacists' characteristics as potential predictors of their intent to prescribe contraceptives.[58]

They found that male pharmacists were less likely to intend on prescribing contraception than female pharmacists in Oregon.[58] Some studies have approached gender as an influencing factor for confidence among health care professionals,[59,60] but in SRH there has been limited work done in this area. Other statically significant predictors for prescribing short-acting hormonal contraceptives and STBBI treatment was completion of the first pharmacy degree in Canada. This may be partly explained by the acceptance of prescribing as part of the pharmacist's role in Canada, and the training incorporated into undergraduate pharmacy programs. In Alberta, educational changes are reflected in the waived one-year practice requirement for obtaining APA for entry level PharmD graduates from accredited Canadian schools of pharmacy since 2018.[61]

In this study, despite the high number of participants with APA, not everyone reported initial prescribing as part of SRH services provided or planned to provide initial prescribing in the future. Previous studies about innovations in health have suggested implementation of new services may be determined by key factors.[62] Several determinants influenced pharmacists' adoption of prescribing in Alberta, including the legitimization of prior practices by the prescribing model, patient focused practice, and relationships with physicians.[62] It is unknown if these factors influenced pharmacists' prescribing practices in this study. Further investigation should explore more in depth why pharmacists, with or without APA, were not planning to provide initial prescribing services in the future.

Besides prescribing, participants were also involved in other extended services. Participants reported administering injections, including injectable contraceptives, HPV vaccine, and recommended vaccines in pregnancy. The high engagement with this service could be related to the higher uptake of injections authorization by community pharmacists in Alberta compared to APA,[63] the remuneration for providing vaccines and nonvaccine injections,[64] and the inclusion of

injections administration training (certification) into the pharmacy curriculum.[38] The only significant predictors we found for this extended service among pharmacists with injections authorization was having APA credential and the type of pharmacy. In this study, pharmacists with APA were more likely to administer injections than the ones without APA. Also, pharmacists working in chain pharmacies were more likely to provide injection services. This may be partly explained by the decision of chain pharmacies to offer and promote injection services.

Overall, participants had a positive attitude towards the provision of SRH services. Likewise, other studies have shown pharmacists' positive attitudes about prescribing contraceptives,[65] and the provision of HPV vaccination services.[66] A recent systematic review illustrated similar attitudes towards the delivery of an extensive range of SRH services.[67] Participants in our study reported that some of the main factors influencing the provision of SRH services were pharmacy staffing, the time required to provide the services, and pharmacists' knowledge. This is consistent with perceived barriers that have been previously reported in the literature.[33,68,69] Moreover, the results are also consistent with a recent qualitative study from the United Kingdom (UK).[70] However, in addition to trained pharmacy staff, lack of privacy and awareness of the service were the main barriers reported to the adequate provision of SRH services.[70] These factors need to be considered in order to further expand pharmacists' roles as SRH providers.

It is not unusual for community pharmacists to feel confident in providing education on SRH since educating and counselling services are considered traditional pharmacists' roles.[71] However, results revealed lower confidence scores for medical abortion, prevention and testing of STBBI, female sexual dysfunction, and care of the LGBTQ+ patient in comparison to the other SRH topics. After performing the multiple regression analysis, two influencing factors were

identified. First, active involvement in SRH (number of services provided) was an important factor for overall confidence score. As supported by the results of this study, confidence has been strongly associated with practice, training, and experience in other studies.[72,73] Second, participants who completed their first pharmacy degree in Canada were more likely to feel confident than those who completed their degree outside of Canada. The Canadian pharmacy curriculum and educational approach, in addition to pharmacy practice and policy regulations, may play a role in influencing these results since preparing students for an advanced practitioner role has been a priority for schools in recent years.[74]

The majority of participants reported willingness to expand their role in SRH and expressed interest in additional training. Studies have described pharmacists' interests in increasing their involvement in SRH areas other than contraception, such as HPV vaccine and expedited STI partner therapy,[65] training on transgender patients' care,[32] abortion medications,[75] and STBBI screening.[76,77] In this study, the preferred topics for additional training were the same topics participants had lower self-reported confidence scores. Moreover, participants expressed interest in additional training in core competencies. As described by Cappiello et al., SRH competencies should be considered as dynamic, and their recognition may help to address the gap of SRH competencies in education and training to meet patients' care needs.[11]

The findings of this study suggest that pharmacists' SRH roles have expanded beyond traditional services in diverse SRH topics, and that pharmacists were willing to take on extended roles. The inclusion of several SRH topics and traditional and extended services in the survey helped to have a broader perspective of current practices in this field. The provision of extended services, such as prescribing different contraceptive methods and STBBI treatment, administration of injections, STBBI testing, and addressing SRH health concerns of varied community groups,

are some opportunities to expand pharmacists' SRH roles further. This study offers a plausible insight into pharmacists' attitudes and practices in SRH and may potentiate the delivery of integral patient-centred SRH care in community pharmacies. These results support that most participants were interested in expanding their role in SRH, and additional educational opportunities will support pharmacists to achieve this.

3.4.1 Limitations

This study had some limitations. First, the generalizability of the results is limited due to voluntary, acquiescence, and non-response bias. Community pharmacists who participated may be more interested in SRH, and participants may have a tendency to select positive responses (e.g. report currently providing services), which could influence our results. Although we did not calculate a sample size a priori, the response rate is similar to previous studies in Alberta.[42,48] The Alberta College of Pharmacy does not capture how many registered pharmacists practice in community; however, according to the Canadian Institute for Health Information, there were 3,851 pharmacists practicing in a community setting in Alberta in 2019.[78] Therefore, the sample of this study would represent approximately 8% of the population of interest. Even though we considered strategies to increase response rates, the number of non-submitted responses in this study reduced the overall sample size. We cannot conclude whether this was a result of email checking habits, length of the survey, or interest.[79] However, it is important to keep in mind the survey was distributed over the summer months, and during the COVID-19 pandemic which may have also impacted response rates. Second, it may be that some members of the population are not adequately represented in the sample. In this study, there was a slight over-representation of females (66% vs 60%), pharmacists < 30 years old (24% vs. 14%) and 31-40 years old (40% vs. 36%) compared to all pharmacists registered in Alberta (Alberta College of Pharmacy, personal communication,

November 2020). Third, based on our findings, we cannot conclude about frequency of provision, demand, or impact of the provision of SRH services by community pharmacists. The results reflect what participants consider as "currently provided", but it does not answer how often they are providing the services. Finally, while validity testing on the survey was performed, test-retest reliability was not measured.

3.4.2 Implications

To date, research has focused on specific SRH topics rather than on the full spectrum of SRH services provided by community pharmacists, and most research has been conducted in the US and UK. Future research exploring practices, attitudes, self-reported confidence, and additional training preferences related to SRH in other regions and countries is needed. Future research should address more in-depth why community pharmacists are not providing initial prescribing services, how to support the adoption of extended practices, and also characterize pharmacist SRH services using administrative data. These results can guide future studies evaluating the impact of additional training programs on self-reported confidence and delivery of comprehensive SRH services, including STBBI testing and treatment and initial prescribing of hormonal contraceptives and IUDs.

3.5 Conclusion

Based on our results, community pharmacists in Alberta are engaged in providing several SRH services and have a positive attitude towards their SRH role. Our results indicate that in addition to traditional SRH services, pharmacists are providing extended services, such as renewing prescriptions, initial prescribing, and administering injectable contraceptives or HPV vaccine. Preliminary data suggest that there is an opportunity to expand pharmacists' SRH role in areas like contraceptive prescribing, STBBI testing and treatment, HIV PrEP, and medical abortion.

However, several factors and additional support need to be considered. This study addressing the broad scope of pharmacy practice in Alberta offers more insight into understanding community pharmacists current and potential roles in SRH.

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Table 3.1 Participants characteristics

Characteristics	n (%)
Gender	
Female	199 (66)
Age range	
20-30 years	71 (24)
31-40 years	120 (40)
41-50 years	60 (20)
51-60 years	41 (14)
61-70 years	9 (3)
71+ years	0 (0)
Country of first pharmacy degree	
Canada	210 (69)
Other	93 (31)
Professional Education	
Bachelor of Pharmacy	239 (79)
Doctor of Pharmacy (PharmD)	32 (11)
Residency	3 (1)
Post-professional or post-baccalaureate PharmD	3 (1)
Master (MSc or Mpharm)	20 (7)
Doctor of Philosophy (PhD)	4 (1)
Years of registration as a pharmacist	
< 1 year	16 (5)
1-5 years	92 (30)
6-10 years	63 (21)
11-20 years	68 (22)
21-30 years	38 (13)
>31 years	25 (8)
Additional authorizations	
Additional prescribing authorization (APA)	201 (67)
Injections authorization	290 (97)
Practitioner Identification (Prac ID)	221 (74)
Type of pharmacy	
Independent	83 (27)
Corporate/chain	172 (57)
Banner/franchise	44 (15)
Other	3 (1)
Area	
Large urban population area (>100,000)	178 (59)
Medium urban population area (30,000 – 99,999)	59 (19)
Small urban population area (1,000-29,999)	60 (20)
Rural area (less than 999)	6 (2)

Table 3.2 Current SRH services provided by community pharmacists and plans to provide in the future

Service (n)	Currently providing n (%)	Planning to provide in future n* (%)		
		Yes	No	Do not know
Pregnancy Tests				
Patient education on pregnancy tests (302)	211 (70)	27 (30)	13 (14)	51 (56)
Ovulation Tests				
Patient education on ovulation tests (302)	152 (50)	46 (31)	24 (16)	79 (53)
Contraception				
Dispense				
Combined hormonal contraceptives (with prescription) (303)	298 (98)	1 (20)	1 (20)	3 (60)
Progestin-only birth control pill (e.g. mini-pill or POPs) (303)	299 (99)	0 (0)	2 (50)	2 (50)
Injectable hormonal contraceptive (302)	293 (97)	4 (44)	1 (11)	4 (44)
Levonorgestrel – IUD (303)	294 (97)	1 (11)	2 (22)	6 (67)
Copper– IUD (302)	267 (88)	11 (31)	4 (11)	20 (57)
Initial prescribing for				
Combined hormonal contraceptives (303)	81 (40)†	75 (36)	37 (18)	99 (47)
Progestin-only birth control pill (e.g. mini-pill or POPs) (302)	71 (36)†	83 (37)	37 (16)	107 (47)
Injectable hormonal contraceptive (303)	49 (24)†	85 (34)	47 (19)	119 (47)
Levonorgestrel – IUD (303)	17 (8)†	49 (17)	116 (41)	117 (42)
Copper– IUD (303)	10 (5)†	41 (14)	127 (44)	123 (42)
Extend/renew prescriptions for				
Combined hormonal contraceptives (302)	298 (99)	2 (50)	1 (25)	1 (25)
Progestin-only birth control pill (e.g. mini-pill or POPs) (303)	290 (96)	5 (39)	1 (8)	7 (54)
Injectable hormonal contraceptive (303)	273 (90)	7 (23)	7 (23)	16 (53)
Levonorgestrel – IUD (303)	45 (15)	28 (11)	124 (48)	106 (41)
Copper– IUD (303)	39 (13)	26 (10)	131 (50)	107 (40)
Administration of				
Injectable hormonal contraceptive (303)	261 (90)§	13 (34)	9 (24)	16 (42)
Patient education on				
Combined hormonal contraceptives (303)	295 (97)	1 (14)	1 (14)	5 (71)
Progestin-only birth control pill (e.g. mini-pill or POPs) (303)	292 (96)	2 (20)	0 (0)	8 (80)
Injectable hormonal contraceptive (302)	285 (94)	6 (35)	1 (6)	10 (59)
Levonorgestrel – IUD (303)	272 (90)	9 (30)	7 (23)	14 (47)
Copper– IUD (302)	257 (85)	14 (31)	9 (20)	22 (49)
Barrier contraception for men (303)	210 (69)	17 (18)	22 (24)	54 (58)

Barrier contraception (non-hormonal) for women (303)	147 (49)	41 (27)	27 (17)	87 (56)
Emergency contraception				
Provision of EC pills (Levonorgestrel only pills, e.g. Plan B®) (303)	294 (97)	0 (0)	7 (78)	2 (22)
Patient education on EC (Levonorgestrel only pills, e.g. Plan B®) (303)	296 (98)	0 (0)	4 (57)	3 (43)
Medial abortion medications				
Dispense abortion medications (e.g. Mifegymiso®) (303)	116 (38)	49 (26)	58 (31)	80 (43)
Patient education on abortion medications (303)	168 (55)	36 (27)	37 (27)	62 (46)
STBBI (chlamydia, gonorrhea, hepatitis B and C, genital herpes, syphilis, trichomoniasis, HIV/AIDS, HPV)				
Patient education on STBBI prevention (303)	216 (71)	29 (33)	17 (20)	41 (47)
Initial prescribing for STBBI treatment (303)	26 (13)†	66 (24)	77 (28)	133 (48)
Gonorrhoea	*24 (89)*			
Chlamydia	*23 (85)*			
Genital Herpes	*19 (70)*			
Hepatitis C	*3 (11)*			
Patient education on STBBI treatment (300)	247 (82)	10 (19)	8 (15)	34 (65)
Dispense HIV PrEP (303)	136 (45)	42 (25)	30 (18)	95 (57)
Administration of the HPV vaccine (303)	272 (94)§	9 (36)	7 (28)	9 (36)
Patient education on HPV vaccine (303)	290 (96)	2 (15)	3 (23)	8 (62)
Maternal and perinatal health				
Patient education on nutrition and vitamin supplementation for prenatal and pregnancy care (303)	278 (92)	6 (24)	6 (24)	13 (52)
Provision of information on safety of medications in pregnancy (302)	297 (98)	0 (0)	2 (40)	3 (60)
Provision of information of recommended vaccines for women prior to and during pregnancy (303)	259 (86)	19 (43)	9 (21)	16 (36)
Administration of recommended (or routine) vaccines in pregnancy (303)	249 (86)§	16 (32)	9 (18)	25 (50)
Provision of information on safety of medications in breastfeeding (303)	298 (98)	0 (0)	1 (20)	4 (80)
General Sexual Health				
Patient education on sexual dysfunction related to medications (302)	255 (84)	19 (40)	3 (6)	25 (53)
Help female patients identify/select options for sexual dysfunction (303)	102 (34)	81 (40)	13 (7)	107 (53)
Help male patients identify/select options for sexual dysfunction (303)	207 (68)	128 (64)	13 (7)	58 (29)
Address sexual health concerns/needs of LGBTQ+ patients (303)	132 (44)	63 (37)	20 (12)	88 (52)

SRH Sexual and Reproductive Health*; IUD* Intrauterine Device; *EC* Emergency Contraception; *STBBI* Sexually Transmitted and Blood-Borne Infections, *HIV* Human Immunodeficiency Virus; *PrEP* Pre-exposure Prophylaxis; *HPV* Human Papilloma Virus; *LGBTQ+* lesbian, gay, bisexual, transgender and queer (or questioning) and others

Responses varied between 300 and 303 - * Total responses based on "No" answers to currently providing questions

† Number of pharmacists with APA who reported providing initial prescribing

§ Number of pharmacists with injections authorization who reported administering injection

Table 3.3 Pharmacists perception of most demanded SRH services by patients

SRH topic	n (%)
Hormonal contraceptives	286 (95)
Emergency contraception	233 (77)
Injectable hormonal contraceptive	191 (63)
Pregnancy tests	176 (58)
Pregnancy/Postpartum/Breastfeeding	162 (54)
Intrauterine devices (Copper-IUD, Levonorgestrel-IUD)	139 (46)
Sexual dysfunction	97 (32)
Barrier contraception for men	68 (23)
STBBI treatment	40 (13)
General sexual health	33 (11)
Ovulation tests	21 (7)
STBBI prevention	14 (5)
Abortion medications	10 (3)
Barrier contraception for women	5 (2)
Sexual health concerns of LGBTQ+ patients	5 (2)
STBBI testing	3 (1)

SRH Sexual and Reproductive Health; *IUD* Intrauterine Device; *STBBI* Sexually Transmitted and Blood-Borne Infections; *LGBTQ+* lesbian, gay, bisexual, transgender and queer (or questioning) and others

Table 3.4 Number (%) of responses to attitudes towards the provision of SRH services

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Median	IQR (Q1-Q3)
It is an important part of a community pharmacist's role to offer advice on sexual and reproductive health. (n=300)	5 (2)	2 (1)	13 (4)	129 (43)	151 (50)	5	4-5
Community pharmacists are adequately trained to provide advice on SRH matters. (n=303)	8 (3)	34 (11)	55 (18)	151 (50)	55 (18)	4	3-4
There is a need for SRH services in the local area near the community pharmacy where I work. (n=303)	4 (1)	19 (6)	74 (24)	140 (46)	66 (22)	4	3-4
Young people (25 years old and below) use/would use SRH services in the community pharmacy where I work. (n=300)	5 (2)	17 (6)	72 (24)	150 (50)	56 (19)	4	3-4
Pharmacists know when to advise patients on the need to consult a physician for SRH advice/treatment. (n=303)	3 (1)	11 (4)	34 (11)	157 (57)	98 (32)	4	4-5
Community pharmacists should be more involved in sexually transmitted infections prevention, screening, testing, and treatment. (n=301)	6 (2)	29 (10)	69 (23)	111 (37)	86 (29)	4	3-5
The patient is more likely to ask questions about SRH to a community pharmacist than his/her doctor. (n=302)	18 (6)	61 (20)	90 (30)	87 (29)	46 (15)	3	2-4
In the community pharmacy where I work, the SRH services currently offered are used regularly. (n=300)	10 (3)	46 (15)	94 (31)	125 (42)	25 (8)	3.5	3-4
As a pharmacist, I have an ethical responsibility to provide SRH services. (n=298)	3 (1)	6 (2)	24 (8)	157 (53)	108 (36)	4	4-5
There is a need to expand the provision of SRH services in the community pharmacy where I work. (n=300)	4 (1)	29 (10)	91 (30)	121 (40)	55 (18)	4	3-4
I would feel embarrassed giving SRH advice to patients. (n=303)	119 (39)	121 (40)	41 (14)	20 (7)	2 (1)	4	4-5
I have religious or moral objections to providing some SRH services. (n=302)	169 (56)	72 (24)	13 (4)	30 (10)	18 (6)	5	4-5

SRH Sexual and Reproductive Health; *IQR* Interquartile Range

Median and IQR determined by the survey responses on a 5-point Likert scale, where 1 = strongly disagree and 5 = strongly agree

Total responses varied between 298-303

Table 3.5 Number (%) of responses to factors that may influence the provision of SRH services

Factors (n)	No effect on the services	Little impact on the services	Neutral	Somewhat impacts the services	Impacts the services to a great extent	Median	IQR (Q1-Q3)
Pharmacists' knowledge (302)	7 (2)	20 (7)	13 (4)	98 (32)	164 (54)	5	4-5
Pharmacy education at university (302)	10 (3)	24 (8)	55 (18)	117 (39)	96 (32)	4	3-5
Opportunities for professional development (303)	5 (2)	20 (7)	38 (13)	118 (39)	122 (40)	4	4-5
Time required to provide services (301)	3 (1)	18 (6)	14 (5)	106 (35)	160 (53)	5	4-5
Compensation for services (301)	9 (3)	19 (6)	40 (13)	116 (39)	117 (39)	4	4-5
Community pharmacist's motivation to offer services (301)	7 (2)	18 (6)	38 (13)	128 (43)	110 (37)	4	4-5
Pharmacy owner/manager's motivation to support the offer of services (303)	13 (4)	28 (9)	51 (17)	105 (35)	106 (35)	4	3-5
Public acceptance of services provided by pharmacists (303)	9 (3)	23 (8)	41 (14)	116 (38)	114 (38)	4	4-5
Consultation space (private/semiprivate room) (301)	18 (6)	25 (8)	25 (8)	80 (27)	153 (51)	5	4-5
Pharmacy staffing (workload, available staff) (302)	2 (1)	6 (2)	19 (6)	88 (29)	187 (62)	5	4-5
Access to practice tools or guidelines (302)	8 (3)	15 (5)	21 (7)	110 (36)	148 (49)	4	4-5
Access to patients' information (302)	10 (3)	34 (11)	39 (13)	97 (32)	122 (40)	4	3-5
Sharing information with other health professionals (300)	6 (2)	41 (14)	65 (22)	107 (36)	81 (27)	4	3-5
Patients' perception of confidentiality being maintained by pharmacists (300)	14 (5)	38 (13)	46 (15)	79 (26)	126 (42)	4	3-5

SRH Sexual and Reproductive Health*; IQR* Interquartile Range

Median and IQR determined by the survey responses on a 5-point Likert scale, where 1 = no effect on the services and 5 = Impacts the services to a great extent

Total responses varied between 301-303

Table 3.6 Number (%) of responses to self-reported confidence on patient SRH education

SRH topic (n)	Not at all confident	Only slightly confident	Somewhat confident	Moderately confident	Very confident	Median	IQR (Q1-Q3)
Pregnancy tests (303)	5 (2)	7 (2)	23 (8)	88 (29)	180 (59)	5	4-5
Ovulation tests (301)	23 (8)	31 (10)	75 (25)	85 (28)	87 (29)	4	3-5
Barrier contraception for men (300)	5 (2)	12 (4)	36 (12)	91 (30)	156 (52)	5	4-5
Barrier contraception (non-hormonal) for women (301)	28 (9)	63 (21)	59 (20)	86 (29)	65 (22)	4	2-4
Hormonal contraceptives (302)	0 (0)	9 (3)	20 (7)	84 (28)	189 (63)	5	4-5
Injectable hormonal contraceptive (300)	0 (0)	9 (3)	20 (7)	101 (34)	170 (57)	5	4-5
IUD (302)	2 (1)	22 (7)	53 (18)	115 (38)	110 (36)	4	3-5
Abortion medications (302)	49 (16)	77 (25)	83 (27)	59 (20)	34 (11)	3	2-4
Emergency contraception (300)	3 (1)	7 (2)	21 (7)	90 (30)	179 (60)	5	4-5
STBBI treatment (300)	16 (5)	40 (13)	66 (22)	111 (37)	67 (22)	4	3-4
STBBI prevention (303)	36 (12)	65 (21)	83 (27)	74 (24)	45 (15)	3	2-4
STBBI testing (301)	114 (38)	67 (22)	60 (20)	35 (12)	25 (8)	2	1-3
Prenatal Care/Pregnancy (301)	2 (1)	23 (8)	38 (13)	114 (38)	124 (41)	4	4-5
Postpartum/Breastfeeding (301)	2 (1)	18 (6)	50 (17)	111 (37)	120 (40)	4	4-5
Male sexual dysfunction (302)	11 (4)	26 (9)	75 (25)	121 (40)	69 (23)	4	3-4
Female sexual dysfunction (301)	38 (13)	84 (28)	92 (31)	59 (20)	28 (9)	3	2-4
Sexual health concerns of LGBTQ+ patients (302)	79 (26)	68 (23)	96 (32)	46 (15)	13 (4)	3	1-3
General sexual health (302)	3 (1)	26 (9)	80 (26)	148 (49)	45 (15)	4	3-4

SRH Sexual and Reproductive Health; *IUD* Intrauterine Device; *STBBI* Sexually Transmitted and Blood-Borne Infections; *LGBTQ+* lesbian, gay, bisexual, transgender and queer (or questioning) and others; *IQR* Interquartile Range

Median and IQR determined by the survey responses on a 5-point Likert scale, where 1 = not at all confident and 5 = very confident

Total responses varied between 300-303

Table 3.7 Pharmacists preferences for additional training on SRH topics

SRH topic	n (%)
STBBI treatment	163 (64)
STBBI prevention	140 (55)
STBBI testing	132 (52)
Sexual health concerns of LGBTQ+ patients	126 (50)
Abortion medications	121(48)
Sexual dysfunction	99 (39)
Intrauterine devices (Copper-IUD, Levonorgestrel-IUD)	76 (30)
General sexual health	68 (27)
Ovulation tests	68 (27)
Hormonal contraceptives	61 (24)
Pregnancy/Postpartum/Breastfeeding	57 (22)
Barrier contraception for women	49 (19)
Injectable hormonal contraceptive	26 (10)
Pregnancy tests	26 (10)
Emergency contraception	21 (8)
Barrier contraception for men	7 (3)

SRH Sexual and Reproductive Health; *IUD* Intrauterine Device; *STBBI* Sexually Transmitted and Blood-Borne Infections; *LGBTQ+* lesbian, gay, bisexual, transgender and queer (or questioning) and others

Table 3.8 Pharmacists preferences for additional training on SRH competencies

SRH competency based on WHO guidelines	n (%)
Referrals – gain knowledge in providing references when necessary (community-based resources and/or other health care providers)	189 (75)
Counselling – use of appropriate and straightforward language	171 (68)
Education and counselling – recognize individual needs	165 (66)
Delivery of SRH care – deliver according to individuals and community's needs	161 (64)
Gender differences and diversity – identification and respect	154 (61)
Health history recompilation – focus on factors related to SRH	140 (56)
Respect individual dignity – approach all clients in a non-judgmental and non-discriminatory manner	99 (39)
Confidentiality and privacy – application to SRH	72 (29)

SRH Sexual and Reproductive Health; *WHO* World Health Organization

Table 3.9 Multivariate analysis for self-reported confidence scores about providing patient education on SRH topics

	Self-reported confidence score	
Predictor	Regression coefficient (95% CI)	*p*-value
Number of services currently provided	0.85 (0.68-1.03)	< 0.0001
Gender (ref: Male)		
Female	-1.66 (-4.13-0.81)	0.187
Age range (ref: 20-30 years)		
31-40 years	1.87 (-1.27-5.02)	0.242
41-50 years	3.46 (-0.23-7.15)	0.066
>51 years	4.05 (0.28-7.8)	0.036
Country of first pharmacy degree (ref: Other)		
Canada	4.68 (1.86-7.50)	0.001
Pharmacy Education (ref: BScPharm)		
PharmD	-1.84 (-0.79-2.10)	0.359
Residency + post professional PharmD	0.14 (-7.7-7.99)	0.972
Graduate (MSc + Ph.D)	1.41 (-3.12-5.95)	0.541

SRH Sexual and Reproductive Health

Table 3.10 Univariate analysis for factors associated with initial prescribing by pharmacists with APA (n=201)

	Initial prescribing					
	Combined hormonal contraceptive	Progestin-only pills	Injectable contraceptives	Levonosgestrel-IUD	Copper-IUD	STBBI
Predictor	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Gender (ref: Male)						
Female	0.43 (0.25-0.71)*	0.42 (0.25-0.72)*	0.50 (0.27-0.92)*	0.35 (0.14-0.85)*	0.27 (0.07-0.92)*	0.79 (0.35-1.86)
Age range (ref: 20-30 years)						
31-40 years	1.47 (0.77-2.88)	1.62 (0.80-3.44)	1.87 (0.81-4.69)	0.69 (0.20-2.50)	3.68 (0.61-70.35)	2.04 (0.69-7.46)
41-50 years	0.98 (0.44-2.17)	1.23 (0.52-2.93)	1.48 (0.67-4.89)	1.47 (0.42-5.34)	3.68 (0.46-75.58)	1.86 (0.51-7.60)
>51 years	1.52 (0.68-3.37)	2.16 (0.93-5.12)	1.73 (0.61-4.96)	1.15 (0.28-4.56)	1.43 (0.06-36.71)	1.07 (0.20-5.07)
Country of first pharmacy degree (ref: Other)						
Canada	1.44 (0.85-2.42)	1.48 (0.85-2.56)	2.10 (1.10-3.78)*	0.90 (0.31-2.29)	1.93 (0.54-6.58)	2.28 (1.01-5.10)*
Years of registration as a pharmacist (ref: 0-5 years)						
6-10 years	1.57 (0.80-3.05)	1.90 (0.92-3.94)*	1.50 (0.66-3.36)	1.40 (0.33-5.48)	0.56 (0.03 – 4.52)	1.82 (0.64-5.20)
11-20 years	1.22 (0.62-2.37)	1.83 (0.90-3.76)*	1.49 (0.67-3.30)	2.363 (0.72-8.30)	4.02 (1.07-1.92)**	1.67 (0.58-4.76)
>21 years	1.01 (0.49-2.01)	1.40 (0.65-2.99)	0.84 (0.32-2.03)	1.78 (0.48-6.63)	- (-)	0.41 (0.06-1.70)
APA (ref: Yes)	6.21 (3.18-13.36)*	16.48 (5.36-45.37)*	10.64 (3.77-44.58)*	2.26 (0.81-8.03)	5.29 (0.99-97.73)	15.01 (3.12-269.86)*
Prac ID (ref: Yes)	2.60 (1.41-5.08)*	2.65 (1.36-5.58)*	2.30 (1.08-5.48)*	1.20 (0.45-3.78)	1.70 (0.43-11.30)	3.21 (1.08-13.77)
Area (ref: Large urban)						
Medium urban	2.03 (1.08-3.76)*	1.93 (0.99-3.71)*	2.55 (1.20-5.34)*	3.33 (1.17-9.49)*	2.65 (0.74- 9.15)	1.99 (0.75-5.00)
Small urban + rural	1.48(0.79-2.71)	1.89 (0.99-3.56)*	2.39 (1.15-43.92)*	1.74 (0.51-5.43)	- (-)	1.27 (0.43-3.37)

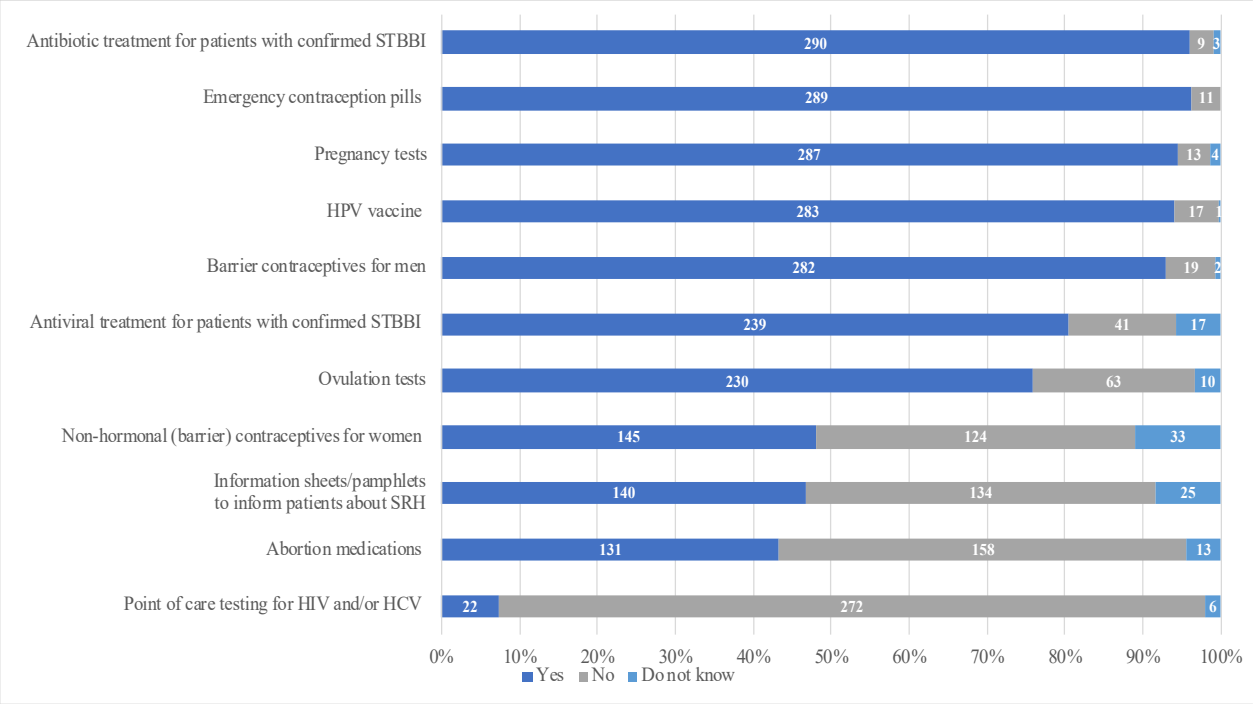
* $p < 0.05$; OR odds ratios; CI confidence interval; (R) reference; IUD intrauterine device; STBBI sexually transmitted infections

Table 3.11 Univariate analysis for factors associated with administration of injections by pharmacists with injections authorization (n=290)

Predictor	Administration of injections		
	Injectable contraceptives OR (95% CI)	HPV vaccine OR (95% CI)	Recommended vaccines in pregnancy OR (95% CI)
Gender (ref: Male)			
Female	0.61 (0.23-1.42)	2.12 (0.80-5.61)	0.81 (0.38-1.63)
Age range (ref: 20-30 years)			
31-40 years	1.54 (0.55-4.25)	0.72 (0.19-2.32)	1.82 (0.78-4.23)
41-50 years	0.670 (0.25-1.96)	1.69 (0.32-12.54)	1.66 (0.63-4.72)
>51 years	1.92 (0.52-9.16)	0.90 (0.19-4.77)	1.13 (0.43-3.10)
Country of first pharmacy degree (ref: Other)			
Canada	1.92 (0.80-5.34)	0.57 (0.22-1.54)	0.90 (0.45-1.84)
Years of registration as a pharmacist (ref: 0-5 years)			
6-10 years	1.16 (0.39-3.88)	0.74 (0.25-2.36)	1.17 (0.50-2.91)
11-20 years	0.76 (0.28-2.10)	- (-)	3.21 (1.13-11.51)
>21 years	0.91 (0.32-2.81)	1.11 (0.33-4.33)	0.99 (0.43-2.40)
APA (ref: Yes)	4.54 (2.06-10.59)*	2.70 (1.03-7.31)*	2.74 (1.40-5.40)*
Prac ID (ref: Yes)	4.21 (1.92-3.90)*	3.98 (1.51-10.83)*	1.40 (0.67-2.82)
Type of pharmacy (ref: Independent)			
Corporate/Chain	2.50 (1.05-6.06)*	2.90 (1.04-7.31)*	2.37 (1.11- 5.05)*
Banner/Franchise	1.33 (0.45-4.43)	3.98 (1.51-98.95)	1.07 (0.43-2.90)

* $p < 0.05$; OR odds ratios; CI confidence interval; HPV human papillomavirus

Figure 3.1 Availability of SRH products and services*



SRH Sexual and Reproductive Health, *STBBI* Sexually Transmitted and Blood-Borne Infections, *HIV* Human Immunodeficiency Virus, *HCV* Hepatitis C Virus, *HPV* Human Papillomavirus

* Total responses varied between 297 and 303

Chapter 4. Summary

4.1 General Discussion

Since sexual and reproductive health (SRH) problems represent major health challenges, improved access to high-quality SRH services is needed worldwide. Some SRH services do not require highly specialized secondary level care, and therefore can be incorporated into primary health care (PHC) for comprehensive, accessible, and patient-centred delivery.[1] As part of a diverse and skilled primary care workforce,[2] pharmacists are increasingly playing a role in the delivery of SRH services.[3] Legislation and expansion of the scope of pharmacists' practice have supported new roles in patient care.[4,5] However, pharmacists extended roles in a broad range of SRH are not fully described. Further information is needed to understand pharmacists' current involvement and factors that influence the delivery of SRH services. This thesis aimed to explore community pharmacists' extended roles, practice experiences, and attitudes towards the provision of a wide range of SRH services. Different methodologies, a scoping review and a cross-sectional study, were used to address the research questions and describe the type of services and SRH topics that are part of community pharmacists' practice. The results from both projects will contribute to advancing community pharmacists as PHC providers of several SRH services.

4.1.1 Community Pharmacists' Roles in Sexual and Reproductive Health: A Scoping Review

The first project was a scoping review of the literature that aimed to identify and synthesize research that reported community pharmacists extended (patient-centred) services across a broad range of SRH areas. Using the methodological framework developed by Arksey and O'Malley,[6] and reporting according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol extension for Scoping Reviews (PRISMA-ScR),[7] we identified 43 articles. Most studies used a quantitative study design. The included articles addressed 4 main SRH topics:

sexually transmitted and blood-borne infections (STBBI), contraception, pregnancy, and sexual dysfunction. The main pharmacists' activity varied across studies, including screening, prescribing, provision of medication, injection administration, education and counselling, screening and treatment, and referral.

Eleven studies reported the feasibility of pharmacy-based services for different SRH topics.[8-18] Users' acceptance and experiences were evaluated in 12 studies, and overall, SRH services were highly accepted and valued by users.[10,12,13,15,18-25] Moreover, three studies that focused on pharmacists' administration of injectable contraceptives administration reported that the high acceptance rate among women was due to the convenient access to community pharmacies.[14,18,22] Several advantages of accessing these services at community pharmacies were reported in the studies, such as the location, extended opening hours, short waiting times and no appointments necessary, anonymity, and the continuous presence of friendly healthcare professionals with a non-judgmental approach. These findings suggest that pharmacy based SRH services enhance access to care, users' experiences, and the uptake of services.

Several barriers were also noted when implementing these services. Integration of services into the daily workflow, pharmacists' remuneration, cost and reimbursement for patients, and policy regulations were commonly reported challenges to expanding SRH services in pharmacies. It seems likely that these factors should be considered when planning to provide these services in a pharmacy setting. Our work has led us to conclude that community pharmacists can play an essential role in the global SRH agenda by enhancing access to SRH services. However, the exclusion of studies exploring this topic that used mystery clients or simulated patients approaches and the variability in reporting results and details across studies may limit the performance of a broader synthesis.

As far as we know, this is the first scoping review identifying and synthesizing research that reported community pharmacists' extended services across SRH areas. Gauly et al. completed a systematic review focused on pharmacy staff and users' experiences and attitudes towards a wide range of pharmacy-based SRH services.[26] Overall, pharmacy staff found the provision of SRH services feasible and users perceived these services as accessible and convenient.[26] These authors found insufficient literature on some SRH topics, such as syphilis screening, gonorrhea screening, and hepatitis B vaccination.[26] Also, they noted that few studies included the delivery of two or more SRH services.[26] These gaps are similar to the ones we found in our scoping review. Even though we used different eligibility criteria, these findings suggest that future research should evaluate the delivery of integrated SRH services provided by community pharmacists and include additional STBBI and contraceptive methods services. Moreover, the available literature is mostly descriptive and future research is needed using other study designs.

The results from our scoping review support that pharmacists' roles have expanded beyond dispensing practice in SRH. The integration of community pharmacy based SRH services into PHC may be an excellent option for addressing the health system burden and enhancing access to patient-centred care delivered in the community. This is particularly important in the era of COVID-19, where access to health services has been greatly impacted.

4.1.2 Community Pharmacists' Roles in Sexual and Reproductive Health: Practices and Attitudes Toward the Provision of Services

The second project within this thesis was a cross-sectional study using a web-based survey to primarily explore Alberta community pharmacists' practices and attitudes towards the provision of SRH services. This study also assessed self-reported confidence in providing SRH education, additional training preferences, as well as examined factors influencing pharmacists' overall

confidence in providing SRH education and delivery of extended SRH services (initial prescribing and injections administration). We developed and validated the survey instrument, considering the scope of pharmacists' practice in the province of Alberta. The survey covered the following SRH topics: pregnancy tests, ovulation tests, contraception (non-hormonal and hormonal), emergency contraception, abortion medications, sexually and blood-borne transmitted infections (STBBI), maternal and perinatal health, and general sexual health.

Overall, participants in this study reported providing traditional and extended services in different SRH areas. The majority of participants indicated dispensing medication and educating patients as part of their current practice, especially in contraception, STBBI and prenatal health. In terms of extended services, the majority of participants reported extending prescriptions for hormonal contraceptives, progestin-only pills, and injectable contraceptives. More than two-thirds (67%) of pharmacists in this study declared having additional prescribing authorization (APA), of whom up to 40% reported initial prescribing for different contraceptive methods, and about 13% for STBBI treatment.

After conducting a univariate regression analysis, some pharmacists' characteristics were found to be statistically significant predictors of the provision of contraceptive initial prescribing among pharmacists with APA. Gender was found to be a predictor of initial prescribing for contraception. Male participants were more likely to provide initial prescriptions for any type of contraceptives, including hormonal contraception, progestin-only pill, injectable contraceptive, and levonorgestrel and copper IUDs, than female participants. In contrast, the country of first pharmacy degree (within Canada versus outside of Canada) was found as predictors of initial prescribing for some medications. Participants who received their first pharmacy degree in Canada were more likely to provide initial prescriptions for combined hormonal contraception, progestin-

only pill, injectable contraceptives, and STBBI treatment than participants who received their first pharmacy degree outside of Canada.

Participants were highly involved in the administration of injections. Almost all pharmacists (97%) reported having injections authorization. Of those, most participants indicated they were currently administering injections, such as injectable contraceptives (90%), HPV vaccine (94%), and vaccines recommended for pregnant women (86%). After conducting a univariate regression analysis, APA and type of pharmacy were found to be statistically significant predictors. Participants working at a franchise/chain pharmacy and those who had APA were more likely to administer injections than participants working at an independent pharmacy and not having APA, respectively.

In general, participants had a positive attitude towards their roles as SRH providers. Participants reported feeling very confident in providing SRH education in the areas of contraception: hormonal contraceptives (63%), injectable contraceptives (60%), emergency contraception (59%), pregnancy test (57%), and barrier contraception for men (52%). However, there were some specific topics with lower self-reported confidence scores. Participants most commonly reported they were not at all confident providing education in the areas of STBBI testing (38%), and sexual health concerns of lesbian, gay, bisexual, transgender, queer or questioning, and others (LGBTQ+) (26%). After multivariate regression analysis, the number of services provided and country of first pharmacy degree were found as predictors of self-reported overall confidence scores in providing SRH education. More services provided and the completion of the first pharmacy degree in Canada were positively related to overall confidence scores in providing SRH education.

This is one of the few studies exploring community pharmacists' practices and attitudes towards the provision of several SRH services, and the first conducted in Canada (Alberta), where pharmacists have an expanded scope of practice. Gale and Watson also explored activities and attitudes of community pharmacists related to SRH services in Scotland in 2008.[27] They described a series of products and services available in pharmacies at the time. We used a similar study design, but the survey content reflected the current scope of practice in Alberta. This study included the prescribing of several contraceptive methods and STBBI treatment, administration of injections, provision of PrEP, and abortion medications. The main factors influencing the provision of SRH services reported in our survey are consistent with the results from previous studies.[27,28] Pharmacists in our study showed a positive attitude towards their role in SRH and also expressed interest in additional training to expand their roles, similar to what Gale and Watson reported earlier.[27]

The results of our study suggest that community pharmacists play a relevant role in society as SRH providers and participants were engaged in providing a wide range of SRH services in Alberta. The findings showed that pharmacist in this study provided traditional and extended SRH services. Still, to position pharmacists as SRH providers, several factors and additional support should be considered. Continued advancement in the SRH agenda will benefit from understanding community pharmacists' roles in SRH since addressing SRH needs at the community level will help increase access to high-quality patient-centred care for everyone.

4.2 Implications and Future Directions

4.2.1 Pharmacy Practice

The results of this research highlight that community pharmacists are involved in SRH and have a positive attitude towards the provision of SRH services. Integrating community pharmacists

as SRH providers in the community is a critical recommendation from this thesis. The provision of traditional and extended SRH services by community pharmacists can enhance access and reach diverse groups. Pharmacy-based services should be considered when planning policy, approaches, and interventions to address challenges and gaps in SRH care. However, successful integration of SRH services requires addressing challenges, such as incorporating services into the daily pharmacy workflow, pharmacy staffing, legislation and policies that regulate pharmacists' remuneration for the services, additional training for pharmacists, and strategies to promote patient engagement.

While our results suggest community pharmacists are already involved in a variety of SRH areas, there is an opportunity to further build on this to establish their role as SRH providers. Advertising available SRH services and being attentive to other issues associated with SRH, such as stigma and discrimination, are important in improving patients' experiences. Pharmacists' roles in SRH should also be recognized and adopted as part of regional and national strategy frameworks. We also suggest incorporating a strong foundation when designing, implementing, and evaluating interventions involving pharmacists, such as the SRH framework and operational approach by the WHO,[29] in order to achieve high-quality SRH care for everyone. Support from professional organizations, including opportunities for additional training identified in this research, is also needed to advance pharmacists' SRH roles.

4.2.2 Pharmacy Education

Based on these findings, we suggest addressing pharmacists' SRH roles and integrating traditional and extended services in educational contexts. Results from our survey suggest that pharmacists would like to expand their role in SRH and have access to additional training. SRH topics including STBBI (treatment, prevention, testing), sexual health concerns of LGBTQ+

patients, abortion medications, as well as female sexual dysfunction should be incorporated into undergraduate pharmacy programs and additional training opportunities for professionals. As the role of pharmacists has evolved into a more patient-centred philosophy, core competencies are needed in addition to knowledge in SRH areas. For that purpose, we suggest incorporating the competencies published by the World Health Organization (WHO) in its document "Core competencies for SRH primary care providers"[30] in educational strategies.

Pharmacy curricula needs to be dynamic to prepare students for changes in scope of practice as well as evolving and complex issues in health care delivery. The inclusion of a holistic approach to sexual health, the vision of the diversity of needs across life and populations, and respectful and positive approaches to SRH[29] are some examples of foundations to guide the development of pharmacists' comprehensive skills. Future pharmacists need to possess the knowledge and skills to deliver high quality accessible SRH services, which includes addressing stigma and other barriers to care.

4.2.3 Pharmacy Research

The results from the scoping review and survey are useful to guide future research. From the scoping review, we identified relevant literature gaps regarding the SRH topics covered by other studies. Future research is needed related to pharmacist prescribing of long-acting contraceptives, screening for other STI, like gonorrhea and syphilis, among others. Moreover, limited studies have focused on SRH as a full spectrum of services provided by community pharmacists as well as services that are tailored to meet the needs of specific groups, including the LGBTQ+ community. These gaps represent an opportunity for studies to address new topics and individualized services from the pharmacy practice perspective. To our knowledge, this is one of

the few reviews looking at a full-spectrum of pharmacy-based SRH services, which contributes to building the body of knowledge in this area.

The results of our quantitative study showed that participants were providing various SRH services and reported feeling confident about providing SRH education on several topics. However, we also found predictors associated with these results. Future research is needed to explore these findings more in-depth. The use of a qualitative approach, such as in-depth interviews, to understand further the impact of factors on confidence in providing SRH education and the delivery of extended services would be useful. This may provide further insights into differences, if any, between female and male pharmacists and pharmacists who trained outside of Canada versus at a Canadian school.

Our findings are based on a particular sample of Alberta community pharmacists and self-reported current practices. However, we cannot draw conclusions regarding how often these services are provided or if these results are generalizable to all community pharmacists in Alberta. Future research using provincial health administrative data may be useful in answering these questions, particularly related to initial prescribing of contraception or STBBI treatment, and vaccine or injections administration. In addition, patient demand and awareness by patients and impact of pharmacy based SRH services are additional areas that should be further explored.

The results from the survey covered a variety of SRH topics and services based on the legislation enacted in Alberta in the last 13 years, which allows pharmacists to provide extended services and receive compensation for some of them. This research project may highlight the need for other jurisdictions to assess the provision of traditional services in this area and also evaluate extended SRH services based on legislation and policies. As practice, education, and cultural norms differ worldwide, research in other regions and countries is also needed in order to understand

pharmacists' attitudes, confidence, and perceived needs for professional development tools or additional training. Finally, our findings have the potential to inform future research to generate professional development tools and additional training based on pharmacists' perceived needs and evaluate their impact on practice and confidence scores in providing SRH services.

4.3 Conclusion

This thesis explored community pharmacists' roles in the provision of SRH services. The findings from both studies showed that community pharmacists are engaged in providing several traditional and extended SRH services. The results suggest that the inclusion of community pharmacists as SRH providers will help improve access within community settings. However, several challenges need to be addressed to implement these services and position community pharmacists as sustainable and affordable SRH providers. This thesis highlights the opportunity to promote community pharmacists as members of the PHC workforce to help address the SRH agenda. Future research may consider exploring a broad range of SRH services, services tailored to different populations within the community, the impact of additional training for pharmacists, and explore the use of administrative health data to capture the extent of pharmacists' involvement in extended SRH services.

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Appendices

Appendix A: 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

Appendix B: University of Alberta Ethics Approval

Approval Form

Date:	January 9, 2020
Study ID:	Pro00095881
Principal Investigator:	Christine Hughes
Study Title:	International Comparison of Community Pharmacists' Roles and Attitudes in Provision of Sexual and Reproductive Health Services
Approval Expiry Date:	Friday, January 8, 2021
Approved Consent Form:	Approval Date: 1/9/2020 — Approved Document: Informed consent
Sponsor/Funding Agency:	Faculty of Pharmacy & Pharmaceutical Sciences (Taiho Fund)

Thank you for submitting the above study to the Health Research Ethics Board - Health Panel. Your application, including the following, has been reviewed and approved on behalf of the committee;

- Invitation Letter (1/7/2020)
- Final Canada - International Survey (12/19/2019)
- Research Proposal (12/19/2019)

Any proposed changes to the study must be submitted to the REB for approval prior to implementation. A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

Approval by the Health Research Ethics Board does not encompass authorization to access the patients, staff or resources of Alberta Health Services or other local health care institutions for the purposes of the research. Enquiries regarding Alberta Health Services approvals should be directed to (780) 407-6041. Enquiries regarding Covenant Health should be directed to (780) 735-2274.

Sincerely,

Anthony S. Joyce, PhD.
Chair, Health Research Ethics Board - Health Panel

Note: This correspondence includes an electronic signature (validation and approval via an online system).

Appendix C: Informed Consent

International comparison of community pharmacists' roles and attitudes in provision of Sexual and Reproductive Health (SRH) services

STUDY INVESTIGATORS

Principal Investigator:
Christine Hughes, Faculty of Pharmacy & Pharmaceutical Sciences, University of Alberta, Canada

Co-investigators:
Javiera Navarrete, Faculty of Pharmacy & Pharmaceutical Sciences, University of Alberta, Canada
Terri Schindel, Faculty of Pharmacy & Pharmaceutical Sciences, University of Alberta, Canada
Nese Yuksel, Faculty of Pharmacy & Pharmaceutical Sciences, University of Alberta, Canada
Shigeo Yamamura, Faculty of Pharmaceutical Sciences, Josai International University, Japan
Tomoko Terajima, Faculty of Pharmaceutical Sciences, Josai International University, Japan
Tatta Sriboonruang, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand
Puree Anantachoti, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand
Chanthawat Patikorn, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand

Invitation to Participate: You are invited to participate in this research study about community pharmacists' roles and attitudes in provision of Sexual and Reproductive Health (SRH) services.

Purpose of the Study: From this research, we would like to explore and compare community pharmacists' roles and attitudes towards provision of SRH services in three countries: Canada, Japan, and Thailand. We are also interested in self-reported confidence and training needs of pharmacists in this field. The results will be used to understand current practices and inform future educational programs and research related to the provision of SRH services by pharmacists.

Participation: If you wish to participate in this study, please complete the attached survey. It should take you approximately 15-20 minutes to complete. Once you have completed the survey, please click the submit button. You do not have to answer any questions that you do not want to answer. Your consent to participate is implied by completing the survey and submitting your responses. The survey will be available for 8 weeks, and everyone will receive 3 reminders in weeks 3, 4 and 6.

Benefits and Risks: There are no direct benefits or known risks from participation in this study.

Confidentiality and Anonymity: The information that you will share will remain strictly confidential and will be used solely for the purposes of this research. The only people who will have access to the data are the investigators. If a publication or presentation results from this research, no names or identifying information will be used. To minimize the risk of security breaches and to help ensure your confidentiality, we recommend that you use standard safety measures. For example, signing out of your account, closing your browser and locking your screen when you are no longer using them or when you have completed the study. REDCAP is the platform used for this study. The results will be presented/published in pooled (aggregate format). Anonymity is guaranteed since you are not being asked to provide your name or any personal information as part of the data collected.

Data Storage: During and after the data collection, the information will be kept on a secure password-protected server at the University of Alberta. All electronic data used for analysis will be stored for a minimum of 5 years on a secure password-protected computer of the principal investigator.

Compensation: There is no direct compensation for participating in this study. You will have the chance to provide your email in a separate link to enter in a draw for a $100 value Amazon gift card (odds of winning 1 in 10).

Voluntary Participation: You are under no obligation to participate. If you choose to participate, you may refuse to answer questions that you do not want to answer. If you decide to withdraw midway through the electronic survey, close the link, and no responses will be included. As the survey is anonymous, once you have submitted your answers, it will no longer be possible to withdraw them from the study.

Information about the Study Results: Results from this study will be available to the participants through professional conference presentations, publication in a pharmacy journal, and social media.

Contact Information: If you have any questions about this study, you can contact Dr. Christine Hughes (principal investigator) – email: christine.hughes@ualberta.ca Tel: (780)492-5903.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 3 at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.
Clicking the "Next" button indicates your willingness to complete the International comparison of community pharmacists' roles and attitudes in provision of Sexual and Reproductive Health (SRH) services survey.

Appendix D: Survey

1. Are you currently working in a community pharmacy? Yes / No

2. How long have you been working at a community pharmacy? _____

Demographics

What is your age range?
- 20-30 years
- 31-40 years
- 41-50 years
- 51-60 years
- 61-70 years
- 71+ years

Please indicate your gender
- Male
- Female
- Non-binary
- Prefer not to answer

How many years have you been licensed as a pharmacist?
- < 1 year
- 1-5 years
- 6-10 years
- 11-20 years
- 21-30 years
- >31 years

What is your highest level of education related to pharmacy?
- Bachelor of Science (BSc) in pharmacy
- Doctor of Pharmacy (PharmD)
- Residency
- Post-professional or post-baccalaureate PharmD
- Master of Science (MSc)
- Doctor of Philosophy (PhD)
- Other (please specify): _____

What is your primary (or main) position?
- Staff Pharmacist (e.g. full time, part time, permanent, etc.)
- Relief/Casual Pharmacist
- Pharmacy Owner
- Pharmacy Manager
- Other (please specify): _____

Sexual and reproductive health services refer to any activity related to sexual and reproductive health offered by pharmacists within community pharmacy settings, such as dispensing, counselling, assessing, educating, and referring. In this survey, the SRH areas covered will be:

- Pregnancy tests
- Ovulations tests
- Contraception (hormonal and non-hormonal)
- Abortion medications
- Emergency contraception
- Sexually transmitted and blood-borne infections (STBBI) (chlamydia, gonorrhea, hepatitis B and C, genital herpes, syphilis, trichomoniasis, HIV/AIDS, human papillomavirus)
- Maternal and perinatal health
- General sexual health

I. A. Please indicate whether the following products and services are currently available at the pharmacy where you work

	YES	NO	DO NOT KNOW
Pregnancy tests	○	○	○
Ovulation tests	○	○	○
Barrier contraceptives for men (e.g. condoms)	○	○	○
Non-hormonal (barrier) contraceptives for women (e.g. diaphragms, sponges, female condoms)	○	○	○
Abortion medications (e.g. Mifegymiso®)	○	○	○
Emergency contraception pills (ECPs) Levonorgestrel only pills, e.g. Plan B®)	○	○	○
Antibiotic treatment for patients with confirmed STBBI (e.g. chlamydia, gonorrhea)	○	○	○
Antiviral treatment for patients with confirmed STBBI (e.g. hepatitis B, hepatitis C, genital herpes)	○	○	○
Please specify: Hepatitis B Hepatitis C Genital Herpes			
F3. Point of care testing for HIV and/or HCV (hepatitis C virus)	○	○	○
F4. HPV vaccine	○	○	○

H2. Information sheets/pamphlets to inform patients about sexual and reproductive health	○	○	○

B. Please indicate whether **you have provided the following services at the pharmacy where you work at as well as plans to provide these services in the future**.

	Currently provided?		**Plan to provide in future?**		
	Yes	**No**	**Yes**	**No**	**Do Not Know**
Pregnancy Tests					
Do you provide patient education on pregnancy tests?	○	○	○	○	○
Ovulation Tests					
Do you provide patient education on ovulation tests?	○	○	○	○	○
Contraception: Hormonal Contraception					
Do you dispense combined hormonal contraceptives (CHC)? (with prescription)	○	○	○	○	○
Do you dispense Progestin-only birth control pill? (e.g. mini-pill or POPs)	○	○	○	○	○
Do you do initial prescribing for combined hormonal contraceptives (CHC)?	○	○	○	○	○
Do you do initial prescribing for Progestin-only birth control pill? (e.g. mini-pill or POPs)	○	○	○	○	○
Do you extend/renew prescriptions for combined hormonal contraceptives (CHC)?	○	○	○	○	○
Do you extend/renew prescriptions for Progestin-only birth control pill? (e.g. mini-pill or POPs)	○	○	○	○	○
Do you provide patient education on combined hormonal contraceptives (CHC)?	○	○	○	○	○
Do you provide patient education on progestin-only birth control pill? (e.g. mini-pill or POPs)	○	○	○	○	○
Contraception: Injectable hormonal contraceptive (medroxyprogesterone depot injection, Depo-provera®)					

Do you dispense injectable hormonal contraceptive?	○	○	○	○	○
Do you do initial prescribing Injectable hormonal contraceptive (medroxyprogesterone depot injection?	○	○	○	○	○
Do you extend/renew prescriptions for injectable hormonal contraceptive?	○	○	○	○	○
Do you provide patient education on injectable hormonal contraceptive?	○	○	○	○	○
Do you inject hormonal contraceptive?	○	○	○	○	○
Contraceptives: Intrauterine devices					
Do you dispense levonorgestrel – Intrauterine Device (LNG-IUD)?	○	○	○	○	○
Do you dispense copper– Intrauterine Device (IUD)?	○	○	○	○	○
Do you do initial levonorgestrel – Intrauterine Device (LNG-IUD)?	○	○	○	○	○
Do you do initial prescribing for copper– Intrauterine Device (IUD)?	○	○	○	○	○
Do you extend/renew prescriptions for levonorgestrel – Intrauterine Device (LNG-IUD)?	○	○	○	○	○
Do you extend/renew prescriptions for copper– Intrauterine Device (IUD)?	○	○	○	○	○
Do you provide patient education on levonorgestrel – Intrauterine Device (LNG-IUD)?	○	○	○	○	○
Do you provide patient education on copper– Intrauterine Device (IUD)?	○	○	○	○	○
Contraception: Barrier contraceptives					
Do you provide patient education on barrier contraception for men (e.g. condoms)?	○	○	○	○	○

Do you provide patient education on barrier contraception (non-hormonal) for women (e.g. diaphragms, sponges, female condoms)?	○	○	○	○	○
Abortion medications					
Do you dispense abortion medications? (e.g. Mifegymiso®)	○	○	○	○	○
Do you provide patient education on abortion medications? (e.g. Mifegymiso®)	○	○	○	○	○
Emergency contraception					
Do you provide emergency contraception pills (ECPs)? (Levonorgestrel only pills, e.g. Plan B®)	○	○	○	○	○
Do you provide patient education on emergency contraception? (Levonorgestrel only pills, e.g. Plan B®)	○	○	○	○	○
Sexually Transmitted and Blood-Borne Infections (STBBI) (chlamydia, gonorrhoea, hepatitis B and C, genital herpes, syphilis, trichomoniasis, HIV/AIDS, human papillomavirus)					
Do you provide patient education on STBBI prevention?	○	○	○	○	○
Do you do initial prescribing for STBBI treatment?	○	○	○	○	○
Please specify: Chlamydia Gonorrhoea Hepatitis B Hepatitis C Genital Herpes Syphilis Trichomoniasis					
Do you provide patient education on STBBI treatment?	○	○	○	○	○
Do you dispense HIV (human immunodeficiency virus) pre-exposure prophylaxis (PrEP)?	○	○	○	○	○
Do you inject the HPV (Human papilloma virus) vaccine?	○	○	○	○	○

Do you provide education on HPV vaccine?	○	○	○	○	○
Maternal and perinatal health					
Do you provide patient education on nutrition and vitamin supplementation for prenatal and pregnancy care?	○	○	○	○	○
Do you provide information on safety of medications in pregnancy?	○	○	○	○	○
Do you provide information of recommended vaccines for women prior to and during pregnancy?	○	○	○	○	○
Do you inject recommended (or routine) vaccines in pregnancy?	○	○	○	○	○
Do you provide information on safety of medications in breastfeeding?	○	○	○	○	○
General Sexual Health					
Do you provide education on sexual dysfunction related to medications?	○	○	○	○	○
Do you help female patients identify/select options for sexual dysfunction?	○	○	○	○	○
Do you help male patients identify/select options for sexual dysfunction?	○	○	○	○	○
Do you address sexual health concerns/needs of LGBTQ+ patients?	○	○	○	○	○

C. Please select the TOP 5 (five) SRH topics **most demanded services by patients in the pharmacy where you work:**

_____ Pregnancy tests
_____ Ovulation tests
_____ Hormonal contraceptives (combined hormonal contraceptives, Progestin-only birth control pill (mini-pill or POPs))
_____ Injectable hormonal contraceptive (medroxyprogesterone depot injection, Depo-provera®)
_____ Intrauterine devices (Copper-IUD, Levonorgestrel-IUD)
_____ Barrier contraception for men (e.g. condoms)
_____ Barrier contraception for women (e.g. diaphragms, sponges, female condoms)
_____ Abortion medications
_____ Emergency contraception
_____ Sexually transmitted and blood-borne infections (STBBI) treatment
_____ STBBI prevention (e.g. HIV PrEP)
_____ STBBI testing (e.g. HIV or HCV point of care testing)
_____ Pregnancy/Postpartum/Breastfeeding

_____ Sexual dysfunction
_____ Sexual health concerns of LGBTQ+ patients
_____ General sexual health

Please provide any additional comments you might have about **current and/or future provision of SRH services**: _____

II. Please indicate how strongly you agree or disagree with each of the following statements about SRH services:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It is an important part of a community pharmacist's role to offer advice on sexual and reproductive health.	○	○	○	○	○
Community pharmacists are adequately trained to provide advice on SRH matters.	○	○	○	○	○
There is a need for SRH services in the local area near the community pharmacy where I work.	○	○	○	○	○
Young people (25 years old and below) use/would use SRH services in the community pharmacy where I work.	○	○	○	○	○
Pharmacists know when to advise patients on the need to consult a physician for SRH advice/treatment.	○	○	○	○	○
Community pharmacists should be more involved in sexually transmitted infections prevention, screening, testing, and treatment.	○	○	○	○	○
The patient is more likely to ask questions about SRH to a community pharmacist than his/her doctor.	○	○	○	○	○
In the community pharmacy where I work, the SRH services currently offered are used regularly.	○	○	○	○	○
As a pharmacist, I have an ethical responsibility to provide SRH services.	○	○	○	○	○
There is a need to expand the provision of SRH services in the community pharmacy where I work.	○	○	○	○	○
I would feel embarrassed giving SRH advice to patients	○	○	○	○	○

I have religious or moral objections to providing some SRH services	○	○	○	○	○

Please provide any additional comments you might have about **the provision of SRH services:**
_____

III. Please indicate to what extent you think the following factors impact (positively or negatively) **your ability to provide SRH services** at the community pharmacy where you work

	No effect on the services	Little impact on the services	Neutral	Somewhat impacts the services	Impacts the services to a great extent
Pharmacists' knowledge	○	○	○	○	○
Pharmacy education at university	○	○	○	○	○
Opportunities for professional development	○	○	○	○	○
Time required to provide services	○	○	○	○	○
Compensation for services	○	○	○	○	○
Community pharmacist's motivation to offer services	○	○	○	○	○
Pharmacy owner/manager's motivation to support the offer of services	○	○	○	○	○
Public acceptance of services provided by pharmacists	○	○	○	○	○
Consultation space (private/semi private room)	○	○	○	○	○
Pharmacy staffing (workload, available staff)	○	○	○	○	○
Access to practice tools or guidelines	○	○	○	○	○
Access to patients' information	○	○	○	○	○
Sharing information with other health professionals	○	○	○	○	○
Patients' perception of confidentiality being maintained by pharmacists	○	○	○	○	○

Please provide any additional comments you might have about **factors that influence the provision of SRH services**: _____

IV. Please indicate to what extent you feel confident about providing **SRH education to patients** in each of the following areas:

	Not at all confident	Only slightly confident	Somewhat confident	Moderately confident	Very confident
Pregnancy tests	○	○	○	○	○
Ovulation tests	○	○	○	○	○
Barrier contraception for men (e.g. condoms)	○	○	○	○	○
Barrier contraception (non-hormonal) for women (e.g. diaphragms, sponges, female condoms)	○	○	○	○	○
Hormonal contraceptives (combined hormonal contraceptives, progestin-only birth control pill (mini-pill or POPs))	○	○	○	○	○
Injectable hormonal contraceptive (medroxyprogesterone depot injection, Depo-provera®)	○	○	○	○	○
Intrauterine devices (Copper-IUD, Levonorgestrel-IUD)	○	○	○	○	○
Abortion medications	○	○	○	○	○
Emergency contraception	○	○	○	○	○
Sexually transmitted and blood-born infections (STBBI) treatment	○	○	○	○	○
STBBI prevention (e.g. HIV PrEP)	○	○	○	○	○
STBBI testing (e.g. HIV or HCV point of care testing)	○	○	○	○	○
Prenatal Care/Pregnancy	○	○	○	○	○
Postpartum/Breastfeeding	○	○	○	○	○
Male sexual dysfunction	○	○	○	○	○
Female sexual dysfunction	○	○	○	○	○
Sexual health concerns of LGBTQ+ patients	○	○	○	○	○
General sexual health	○	○	○	○	○

Please provide any additional comments you might have about **self-reported confidence in providing education to patients related to SRH**:

_____

V. Please answer the following questions about **professional development related to SRH:**

1. Would you like to expand your role in SRH services?

Yes	No	Do Not Know
O	O	O

2. Would you like to have additional training in order to expand your role in SRH services?

Yes	No	Do Not Know
O	O	O

3. Please select the TOP 5 (five) SRH topics **you would like to receive more training**:

_____ Pregnancy tests
_____ Ovulation tests
_____ Hormonal contraceptives (combined hormonal contraceptives, Progestin-only birth control pill (mini-pill or POPs))
_____ Injectable hormonal contraceptive (medroxyprogesterone depot injection, Depo-provera®)
_____ Intrauterine devices (Copper-IUD, Levonorgestrel-IUD)
_____ Barrier contraception for men (e.g. condoms)
_____ Barrier contraception for women (e.g. diaphragms, sponges, female condoms)
_____ Abortion medications
_____ Emergency contraception
_____ Sexually transmitted and blood-borne infections (STBBI) treatment
_____ STBBI prevention (e.g. HIV PrEP)
_____ STBBI testing (e.g. HIV or HCV point of care testing)
_____ Pregnancy/Postpartum/Breastfeeding
_____ Sexual dysfunction
_____ Sexual health concerns of LGBTQ+ patients
_____ General sexual health

4. The World Health Organization (WHO) identifies core SRH competencies that are desirable to deliver SRH services. These competences are useful to protect, provide and promote SRH in the community. From the following competencies suggested by the WHO, please select the ones you would be interested in having more training: **(select all that apply)**

Respect individual dignity – approach all clients in a non-judgmental and non-discriminatory manner	O
Confidentiality and privacy – application to SRH	O
Gender differences and diversity – identification and respect	O
Delivery of SRH care - deliver according to individual's and community's needs	O
Counselling – use of appropriate and straightforward language	O
Education and counselling - recognize individual needs	O

Health history recompilation – focus on factors related to SRH	O
Referrals – gain knowledge in providing references when necessary (community-based resources and/or other health care providers)	O

Please provide any additional comments you might have about **professional development related to SRH:** _____

VI. Please tell us a bit more about your education and practice background.

Where did you get your **first pharmacy degree** (BSc or PharmD)?
- o Canada
- o Other: _____

Have you completed additional continuing education **related to SRH**? Please select all that apply.
Face-to-face course(s)
- o Online course(s)
- o Certifications
- o Other (please specify):_____
- o None

Which of the following authorizations do you have? Please select all that apply.
- o Additional prescribing authorization (APA)
- o Injections authorization
- o Practitioner Identification (Prac ID)

What is the type of community pharmacy where you primarily practice?
- o Independent
- o Corporate/chain
- o Banner/franchise
- o Other (please specify):_____

Where are you employed?
- o Large urban population area (>100,000)
- o Medium urban population area (30,000 - 99,999)
- o Small urban population area (1,000-29,999)
- o Rural area (less than 999)

Please estimate the average number of prescriptions dispensed (per day) in the pharmacy where you work:

Appendix E: Univariate Regression Analysis Used to Select Potential Predictor in the Multiple Regression Analysis

Predictor		Coefficient (S.E)	95% confidence interval	*p*-value
Gender	2. Female	-3.115 (1.469)	-6.0077 - -0.2232	0.0349
	1. Male	Reference		
Age range	2. 31-40 years	5.854 (1.747)	2.4154 – 9.2924	0.0009
	3. 41-50 years	4.634 (2.085)	0.5306 – 8.7382	0.0270
	4. >51 years	5.587 (2.187)	1.2823 – 9.8926	0.0112
	1. 20-30 years	Reference		
First pharmacy school	2. Canada	6.4548 (1.4885)	3.5248 – 9.3849	<0.0001
	1. Other	Reference		
Professional Education	2. Doctor of Pharmacy (PharmD)	-4.4008 (2.2292)	-8.7891 - -0.0124	0.0494
	3. Residency + post prof. Pharm D	2.1659 (1.7403)	-7.1659 – 11.4977	0.6481
	4. Graduate (MSc + PhD)	5.8326 (2.5613)	0.7904 – 10.8748	0.0235
	1. Bachelor of Pharmacy	Reference		
Years of registration as a pharmacist	2. 6-10 years	-2.088 (1.898)	-5.8243 – 1.6488	0.272
	3.11-20 years	1.009 (1.878)	-2.6888 – 4.7066	0.592
	4. >21 years	1.404 (1.898)	-2.3328 – 5.1403	0.460
	1. 0-5 years	Reference		
Years working as a community pharmacist	2. 6-10 years	-2.5035 (1.8371)	-6.1200 – 1.1130	0.174
	3. 11-20 years	-0.5114 (1.9601)	-4.3700 – 3.3472	0.794
	4. >21 years	1.0656 (1.8992)	-2.6731 – 4.8044	0.575
	1. 0-5 years	Reference		
Additional prescribing authorization (APA)	1. Yes	-0.7162 (1.4608)	-3.5918 – 2.1593	0.624
Practitioner Identification (Prac ID)	1. Yes	1.042 (1.531)	-1.9708 – 4.0556	0.496
Type of pharmacy	2. Corporate/chain	-0.3734 (1.6089)	-3.5407 – 2.7939	0.817
	3. Banner/franchise	-0.4762 (2.2252)	-4.8567 – 3.9043	0.831
	1. Independent	Reference		
Area	2. Medium urban population area	-0.0956 (1.8327)	-3.7034 – 3.5122	0.598
	3. Small urban + rural	0.4698 (1.7191)	-2.9143 – 3.8540	0.785
	1. Large urban population area	Reference		