



# The Saskatchewan Medication Assessment Program for Patients With Renal Failure: A Qualitative Study to Understand Health Care Provider Perspectives

Canadian Journal of Kidney Health and Disease  
Volume 7: 1–13  
© The Author(s) 2020  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/2054358120954028  
journals.sagepub.com/home/cjk

Anan Ahmed<sup>1</sup>, David F. Blackburn<sup>1</sup>, Charity Evans<sup>1</sup>, Nicola Rosaasen<sup>2</sup>, and Holly Mansell<sup>1</sup>

## Abstract

**Background:** The Saskatchewan Medication Assessment Program (SMAP) compensates community pharmacists for medication reviews on eligible residents with the goal of optimizing patient care. Although medication reviews are meant to reduce risks associated with complex medication regimens, some patients may already be receiving specialized care from interdisciplinary health care teams from the renal programs in Saskatchewan.

**Objective:** A qualitative analysis was undertaken to examine the perceptions of health care providers about the SMAP process for patients receiving renal care in Saskatchewan. The goal was to explore potential benefits, facilitators, challenges, and/or barriers of the program in this population.

**Design:** Qualitative descriptive study.

**Setting:** The semi-structured interviews took place in the province of Saskatchewan.

**Participants:** Community pharmacists, renal pharmacist, and nephrologists.

**Methods:** All nephrologists, renal pharmacists, and community pharmacies in Saskatoon and Regina were sent an invitation to participate in the study. Semi-structured interviews were completed with participants and were audio-recorded and transcribed verbatim. Coding was performed using NVIVO qualitative software, and meaning units and codes were consolidated into categories and subcategories using qualitative content analysis.

**Results:** A total of 9 community pharmacists, 10 renal pharmacists, and 8 nephrologists were interviewed. Community pharmacists had mixed levels of comfort providing SMAP assessments for renal patients, but expressed the desire to provide the best care possible and described patient benefits. Some categories (eg, barriers and improvements) and subcategories (eg, “collaboration/communication”, “other challenges,” and “suggestions for improvement”) were consistent among all participant groups, while others (eg, “renal patients have complex care needs” and “duplication of service”) were common among both renal pharmacists and nephrologists. The nephrologists had little knowledge of the program and of the role of the community pharmacist, indicating the need for improved education and communication.

**Limitations:** The lack of renal patient perceptions on the SMAP process should be acknowledged and studied in future. A further limitation is the small sample size per subsample group.

**Conclusion:** Despite some negative experiences, all of the participants believed the program can be beneficial. However, several recommendations were suggested to improve the SMAP process in renal patients and other complex patient populations.

## Abrégé

**Contexte:** Dans le but d’optimiser les soins aux patients, le *Saskatchewan Medication Assessment Program* (SMAP) rémunère les pharmaciens communautaires pour procéder à l’examen des médicaments prescrits aux résidents admissibles. Bien que ces examens visent à réduire les risques associés aux schémas posologiques complexes, certains patients reçoivent déjà des soins spécialisés par les équipes interdisciplinaires des programmes de santé rénale de la Saskatchewan.

**Objectifs:** Une analyse qualitative a été menée pour examiner la perception des fournisseurs de soins en regard du processus SMAP pour les patients recevant des soins de santé rénale en Saskatchewan. L’objectif était d’explorer les potentiels bienfaits, facilitateurs, défis et/ou obstacles du programme pour cette population.



**Type d'étude:** Étude qualitative et descriptive.

**Cadre:** Entretiens semi-structurés s'étant tenus dans la province de la Saskatchewan.

**Participants:** Des pharmaciens communautaires, des pharmaciens spécialisés en néphrologie et des néphrologues.

**Méthodologie:** Tous les néphrologues, pharmaciens spécialisés en néphrologie et pharmaciens communautaires de Regina et de Saskatoon ont été invités à participer à l'étude. Des entretiens semi-structurés ont été menés auprès des participants. Les entretiens ont été enregistrés puis transcrits verbatim. Le logiciel d'analyse qualitative NVIVO a servi au codage; les unités et codes de signification ont été regroupés en catégories et sous-catégories à l'aide de l'analyse qualitative de contenu.

**Résultats:** Neuf pharmaciens communautaires, dix pharmaciens spécialisés en néphrologie et huit néphrologues ont été interviewés. Les pharmaciens communautaires étaient plus ou moins confortables à l'idée de faire les évaluations du SMAP pour les patients atteints de néphropathies, mais ont exprimé le souhait d'en décrire les avantages aux patients et de fournir les meilleurs soins que possible. Certaines catégories (obstacles et améliorations) et sous-catégories (collaboration/communication, «autres défis» et «suggestions d'améliorations») étaient cohérentes entre les groupes, alors que d'autres («les patients atteints de néphropathies ont des besoins complexes» ou «dédoublage des services») étaient fréquentes pour les néphrologues et les pharmaciens spécialisés en néphrologie. Les néphrologues en savaient très peu sur le programme et sur le rôle des pharmaciens communautaires, ce qui souligne la nécessité d'améliorer la sensibilisation et la communication.

**Limites:** La perception des patients en regard du SMAP devrait être reconnue et étudiée dans de futurs essais. Aussi, le faible échantillon de chacun des sous-groupes de participants limite les résultats.

**Conclusion:** Malgré quelques expériences négatives, tous les participants ont jugé que le programme peut être bénéfique. Plusieurs recommandations ont été avancées pour améliorer le processus du SMAP pour les patients atteints de néphropathies et pour d'autres populations de cas complexes.

**Enregistrement de l'essai:** Sans objet.

## Keywords

medication review, medication assessment, complex patient, renal, pharmacist role

Received June 11, 2020. Accepted for publication June 21, 2020.

## Background

Several provinces across Canada are now supporting provincially funded medication assessments provided by community pharmacists.<sup>1</sup> One such program is the Saskatchewan Medication Assessment Program (SMAP), which was introduced in 2013 for eligible residents.<sup>1,2</sup> The eligibility criteria for receiving community pharmacist medication reviews vary considerably from province to province. To obtain a medication review through the SMAP program, patients must be 65 years of age or above, take 5 or more medications (prescription and nonprescription), or take an anticoagulant medication or a medication listed in the most current edition of the American Geriatrics Society (AGS) Beers criteria for potentially inappropriate use in older adults.<sup>1-3</sup> Similar to the other medication assessment programs in Canada, SMAP assessments involve a comprehensive, one-on-one interview with a community pharmacist to review the patient's complete set of medications with the goal of addressing the patient's health needs and optimizing drug therapy.

Assessments involve educating patients about their medications and providing recommendations to prescribers for drug-related problems as needed. Of note, many of the other provincial medication assessment programs are less restrictive than in Saskatchewan, because they do not require an age threshold of 65. Some also require fewer than 5 medications.

As publicly funded medication assessment services are relatively new in Canada, formal evaluations of these programs have been limited. A recent study by Currie and colleagues examined pharmacist's perceptions of the SMAP program by way of an electronic self-administered questionnaire.<sup>4</sup> In general, community pharmacists in Saskatchewan enjoyed performing SMAP assessments and nearly 90% of respondents indicated that they were confident in their ability to perform them. Nevertheless, one of the overarching themes from the questionnaire was that respondents struggled with performing assessments for complex patients.<sup>4</sup> Reasons cited included lack of time, inadequate compensation, and/or lack of confidence and

<sup>1</sup>College of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, Canada

<sup>2</sup>Saskatchewan Transplant Program, Saskatchewan Health Authority, Saskatoon, Canada

## Corresponding Author:

Holly Mansell, College of Pharmacy and Nutrition, University of Saskatchewan, Health Sciences Building (Room 3132), 104 Clinic Place, Saskatoon, SK, Canada S7N 2Z4.

Email: holly.mansell@usask.ca

experience in managing complex patients.<sup>4</sup> Another Canadian study examined factors affecting the likelihood of seniors receiving a pharmacy-led medication review funded by Ontario's MedsCheck program.<sup>5</sup> In a random sample of pharmacy claims ( $n = 2\,878\,958$ ), older seniors and those with multiple and potentially inappropriate medications were less likely to receive an assessment, suggesting that pharmacists may prefer to provide the service for less complicated patients.<sup>5</sup> Comprehensive SMAP assessments on complex patient are time-intensive and may cause challenges with workload in a busy pharmacy. Community pharmacists have access to laboratory values through the provincial electronic health record, and medications that are filled at pharmacies in Saskatchewan are populated and retained in the Pharmaceutical Information Program (PIP). Whether or not community pharmacists have the confidence and/or resources to analyze laboratory and clinical information and make medication recommendations on complex or specialized patients requires further study.

The objective of this study was to examine the SMAP process in a complex patient population. We opted to use the example of a renal cohort as individuals with renal failure and those requiring renal replacement therapy such as dialysis or kidney transplant have unique needs, including multiple comorbidities and medications.<sup>6,7</sup> Renal patients in Saskatchewan are cared for by specialized teams consisting of nephrologists and renal pharmacists, and it is also unclear whether the SMAP medication assessments are perceived as a duplication of services. A qualitative analysis was undertaken to characterize the perceptions of the health care providers primarily affected by the SMAP process, including community pharmacists, specialized renal pharmacists, and nephrologists. More specifically, we wanted to learn about whether the health care providers were satisfied and comfortable with the program. We reasoned that sharing their experiences (including potential benefits, facilitators, challenges, and/or barriers) with health care providers and pharmacy stakeholders could provide valuable feedback for conducting these reviews in complex populations.

## Methods

A qualitative description study was undertaken, which aims to explore a phenomenon of interest using participants in a particular situation, and describes a rich description of the experience in an easily understood language.<sup>8</sup> This type of study, which is useful for discovering the who, what, and where of events or experiences often within a health care setting, is the least theoretical of the qualitative approaches.<sup>9</sup>

A semi-structured interview guide was drafted by A.A., an MSc candidate, and H.M., a faculty member from the College of Pharmacy and Nutrition (Online Appendix). Most of the questions for the interview guide (which addressed satisfaction, comfort level, and challenges) were rather broad in nature as this study was primarily intended to

be inductive. However, a few of the questions aimed to probe further into potential barriers that have been identified in literature exploring medication assessments in general<sup>4,5,10,11</sup> (such as time constraints and communication). The interview guide was reviewed by the research team (D.B., C.E., and N.R.) and modified accordingly. It was piloted on a renal nurse and a community pharmacist who were not participants in the study. The application was approved by the University of Saskatchewan Behavioral Research Ethics Board (REB), and operational approval was granted by the governing health authorities.

Renal pharmacists, nephrologists, and community pharmacists were the populations of interest for the study. Criterion sampling, a type of purposeful sampling which involves predefining the criteria and then inviting all subjects that meet the criteria to participate,<sup>12</sup> was used to recruit nephrologists and renal pharmacists. All renal pharmacists and nephrologists who practice in either Saskatoon or Regina were personally emailed a study invitation. A renal pharmacist was defined as a pharmacist who works with an interprofessional renal team within the Saskatchewan Health Authority to provide routine clinical care to chronic kidney disease (CKD), dialysis, or kidney transplant recipients. As these pharmacists do not work in the community pharmacy setting, they do not have a formal mechanism to perform medication reviews through the SMAP program. The community pharmacist sample was recruited using a different strategy called maximum variation. Maximum variation aims to capture a variety of perspectives on a certain phenomenon,<sup>12</sup> which was felt to be important considering the differences in pharmacist training and practice environments in Saskatchewan. All community pharmacies ( $n = 161$ ) within Saskatoon and Regina were faxed an invitation to participate in the study. Of the individuals who replied to this invitation, we aimed to select a heterogeneous cohort in terms of the following characteristics: pharmacist age, gender, pharmacy type (independent vs chain). Unfortunately, as only 2 pharmacists responded, the research team changed the recruitment strategy and personally reached out to several pharmacists to invite participation (purposive sampling),<sup>12</sup> while striving to obtain a variety of demographics such as pharmacist age, gender, workplace location (independent vs chain, rural vs urban). An external pharmacist who arranged preceptor placements for students, with a wide community network, was consulted to help select individuals that would meet these criteria. Community pharmacists were required to have practiced for at least 2 years to participate in the study.

The interviews were conducted one on one in a private area at the participant's place of work or another location that was convenient and preferred by the participant. The interviews were performed by A.A., who had been previously trained to lead interviews. The sessions were audio-recorded, and field notes were taken to provide context. The interviews continued until no further information was added to the dialogue. Each interview was conducted using the

semi-structured interview guide, but no restrictions were placed on the participant responses and a time limit was not enforced.

## Data Analysis

Audio recordings were transcribed verbatim, and the transcripts were input into NVivo qualitative software (version 11, 2017; QRS International Pty Ltd). The data were coded using qualitative content analysis by A.A. and H.M. A deliberate effort was made to stick close to the data (manifest) and preserve the descriptive account by the participants, rather than interpreting the latent content by searching for underlying meanings.<sup>13</sup> First, the transcripts were reviewed in detail to generate an overall impression of the data. After reviewing all transcripts in their entirety, meaning units (sentences and paragraphs) were extracted from the text and condensed and labeled with a code. The first cycle of coding was primarily descriptive in nature and the codes were sorted into common categories and subcategories. Some of the overarching categories were developed from the interview questions (eg, challenges and suggestions for improvement), while others (eg, desire to do well) were created from context of the discussion. The second cycle of coding involved consolidating, renaming, and eliminating redundant codes. At this stage, transcripts were again reviewed in detail and discrepancies between the researchers were resolved by debate and discussion. Each cohort (community pharmacist, renal pharmacist, or nephrologist) was coded separately using this process, prior to round 3, which involved a descriptive analysis of all cohorts. Based on this cross comparison, further refinements were applied to the codes, subcategories, and categories.

## Results

### Community Pharmacists

Overall, there were 28 participants, including 19 pharmacists and 8 nephrologists. Nine community pharmacists who had previously conducted SMAPs (7 from Saskatoon and 2 from Regina) were interviewed regarding their perceptions of the SMAP process. The community pharmacists ranged in age from late 20s to 50s, with a mean of 15 years in practice and had conducted a minimum of one SMAP per month and maximum of 100 SMAPs per year. Two community pharmacists practiced in independent settings while the remaining 7 practiced in chains. Three overarching categories were identified, including SMAP pride, various levels of comfort, and barriers and improvements. Table 1 depicts the categories and subcategories identified within and across all health providers groups along with additional supporting quotes.

**SMAP pride.** It was evident that community pharmacists took pride of the provision of medication assessments and 2 subcategories (program benefits and desire to do well) highlight this finding:

**Program benefits.** Participants discussed benefits of the SMAP program (n = 5). One pharmacist provided several examples of therapeutic interventions that resulted in patient benefit, such as modifying medications, intervening on laboratory results, and recommending vaccinations. Many of the pharmacists described how patients appreciate the medication reviews (n = 5). Community Pharmacist 3 stated,

Usually the patients are so happy to have this one on one time, and they just talk and talk and talk, and they have so many questions. And lots of times, even though you try to gear for about a half an hour, they go over because they just have so much that they want to say. And it seems that they really enjoy that time.

**Desire to do well.** A desire to perform high-quality medication reviews that benefit patients was consistently expressed in quotes by the community pharmacists: Community pharmacist 7 stated, “I don’t just discuss their medications, I discuss how they are doing holistically and try to give them whatever assistance I can or recommendation to the physician where it seems appropriate.” According to community pharmacist 9, “When I do these assessments, it is an in-depth assessment . . . and then come up with solutions sometimes with the prescriber, sometimes without the prescriber, but you are always working with that patient. So lots to do.”

**Various levels of comfort with SMAP process.** As a group, the community pharmacists (n = 9) had varied comfort levels with performing SMAPs in complex and/or renal patients. On one end of the spectrum, community pharmacist 9 was very confident performing medication reviews: “I am very comfortable doing an SMAP on a renal patient. I worked acute care and clinical care for 10 years in the RQHR (Regina Qu’Appelle Health Region).” Three pharmacists, however, stated they were uncomfortable conducting SMAPs on complex groups of patients, such as renal patients or cancer patients. The remaining community pharmacists expressed mixed levels of comfort or being somewhat comfortable with additional training and/or more experience working with renal patients. Community Pharmacist 8 cited,

I am comfortable with some of them, and but some of them I am like, “Am I over my head here? Am I sure I am catching everything?” . . . Sometimes they see a psychiatrist, and they see a nephrologist, and they see a cardiac doctor, and that is not that uncommon. And I am like, “Ok there is just too many variables here.”

**Barriers and improvements.** All community pharmacists discussed challenges they had experienced with the SMAP process (9 sources, referenced in 32 quotes). This category was further stratified according to communication, other challenges, and suggestions for improvement.

**Communication and collaboration.** Communication was described as essential to the success of the SMAP program

**Table I. Categories and Subcategories Within and Across Health Care Provider Groups and Additional Supporting Quotes.**

Category	Subcategory	Community pharmacists	Renal pharmacists	Nephrologists
SMAP Pride	Program benefits	Community pharmacist 9: <i>So people tell me that after their assessment they understand their disease better, they understand their medication better. I can help them to take their medication as prescribed to, and I can work with them and their clinician or prescriber to get a good result.</i>		
	Desire to do well	Community pharmacist 9: <i>I think in general people and society recognize good work, so just if you are feeling let down by government, employers, whoever you think, just remember if you contribute positively to society, to individuals just keep doing that, and it does eventually pay off in your mind, in your brain, in your soul, and also in your pocketbook too. People will be known for the good work that you do over time, and that keeps you going.</i>		
SMAP Concerns	Renal patients have unique complex care needs		Renal pharmacist 7: <i>... it is just that the dialysis patients are a small, select, specific group.</i>	Nephrologist 5: <i>Things like I will see Septra prescribed in renal failure, and they end up with a potassium of 7 and a creatinine, like, huge. I see patients with kidney failure that are given anti-inflammatories all the time. I see patients that are given inappropriate doses according to their eGFR for their medications all the time... They [renal patients] are not as easy to work with.</i>
	Duplication of service		Renal pharmacist 1: <i>But then sometimes, you almost question duplication. If you look at a lean philosophy, is it not really lean.</i>	Nephrologist 7: <i>There is the complexity of the drug itself and the whole side effect interaction with other drugs, the importance of keeping the dose within a certain limit to maintain a good therapeutic level, and the effect of this therapeutic level.</i>
Nephrologist / Pharmacist relationships	Negative experiences		Renal pharmacist 7: <i>So in most cases a global medication review is done on a regular basis for all of those patients anyway in a dialysis specific way.</i>	Nephrologist 8: <i>I would be a little nervous that the service would be a little redundant.</i>
	Appreciation for Renal Pharmacists		Renal pharmacist 3: <i>This one that we got was not signed, no consent, we looked and hydrochlorazine is not a diuretic. And for example, recommendations were things like "separate calcium from calcium channel blockers," which in reality is likely not a concern, but the patient came in quite concerned.</i>	Nephrologist 6: <i>It's like three people [the nephrologist, the renal pharmacist and the community pharmacist] doing the same job.</i>
Nephrologist / Pharmacist relationships	Uncertainty about Community Pharmacists		Renal Pharmacist 8: <i>A pharmacist felt that amlodipine was of the same category as Ramipril and felt that it was a duplicate therapeutic medication... The pharmacist actually didn't realize what the components of Caduet were and was making recommendations based on that.</i>	Nephrologist 6: <i>They do a wonderful job for us and we are so blessed to have them.</i>
	Pharmacist Skills			Nephrologist 8: <i>I can see the benefit theoretically, but I think in the real world, without specialized training, that would be a very difficult thing... I think the community pharmacist may not have access to, from a knowledge standpoint, would be issues surrounding drug treatment for conditions that they don't know or don't understand, conditions that don't have guidelines per say.</i>
				Nephrologist 2: <i>Well most of them [SMAPs] were very well done, but they were missing some information, I thought. For instance, advising that ACE inhibitors should be stopped because the blood pressure was either low or the serum creatinine was high, when if you don't know all the clinical context of why that individual is on an ACE inhibitor (like do they have proteinuria?), then you shouldn't be making those kinds of recommendations, because then family physicians do follow them. Or patients say, "well the pharmacist said I shouldn't be on this drug because of blah, blah, blah," and so the recommendations have been made without all of the information.</i>

(continued)

Table 1. (continued)

Category	Subcategory	Community pharmacists	Renal pharmacists	Nephrologists
Various levels of comfort with SMAP process		Community pharmacist 3: I would definitely need to spend extra time doing homework and catching myself up on all that kind of renal information. Um, so that is one of the challenges I find with some of these more complex patients, is that I feel like I have to go back to school or relearn some of these things, that I am not as familiar with.	Renal pharmacist 5 . . . they have multiple health issues, they are on so many drugs, and it is a specialized area. So unless you work in transplant or renal, it would be hard to make appropriate recommendations as a retail pharmacist for a medication assessment.	Nephrologist 3: The problem is that I don't really have a good grasp of what a community pharmacist grasps. Nephrologist 3: I think there is a lot of range from pharmacist to pharmacist based on my experience.
	Barriers and Improvements	Community pharmacist 2: In the perfect world, it would be great to have visited maybe the renal clinics and to understand that, how they work and what kind of care they get there. And you know, is it sort of like they do the blood work while they are there and then someone comes in and adjusts their medications afterwards. Community pharmacist 2: I guess just the time to do a proper job, staffing to be able to have the time to do a proper job [is a challenge]. Community pharmacist 6: I think there needs to be more training especially for the current students. I mean sometimes it is hard to get training out to us who have graduated. If we had better training for current students, I learn from the students that we have. I ask them questions. I find them very valuable resources, and they need more training. I would like more money for each med review so I can have proper time to do a good job, so they can give me more hours for it. I would like to see education to doctors and patients. I would like the ability to order lab tests like phenytoin and creatinine clearance. It is frustrating to spend, you know, five hours on a med review and have the doctor ignore it. Community pharmacist 8: Ok, so I feel that maybe the criteria are a bit too controlled. It is lovely to have 6.5 year olds on five medications, that captures a lot, but there are a lot of other people that it doesn't capture. So it was a start, but now maybe it is time to maybe look at whether they feel that this is successful the way it is and the way it is set up and if it is and they see that there is some benefit could they expand it. Community pharmacist 9: One of the challenges I have is that if you don't do that second yearly med review exactly 365 days from the first, that person now loses their packaging coverage. Maybe give the pharmacy a bit more grace to get through! I would give them like 14 months to the day.	Renal pharmacist 1: A lot of patients have close relationships with their community pharmacist, which is excellent and we encourage it [collaboration] . . . because, obviously, community pharmacists are valuable for that ongoing care . . . At least there should be some working relationship or collaboration, with the clinic to make sure that it aligns with the treatment plan that has been sent out by the nephrologist. Renal Pharmacist 3: Our patients are also followed by several different physicians, and I think that is a challenge too. So as a community pharmacist doing an SMAP you are not just communicating with a family physician but also a specialist, and the reality of health care, is that everyone doesn't always know what everyone is doing. And what a family physician thinks is happening may not necessarily be what the specialist is doing, and that is necessarily not the right thing, but it is the reality. So that is something that is challenging—So these people have many prescriptions, they have several health care providers, you know it is a team approach, but sometimes the team is slightly disjointed.	Nephrologist 7: I would prefer it [communication] to be before so that I can indicate to the pharmacist right away what the patient's kidney disease is and what my thought process is in prescribing certain medications. Because I have found in my experience that sometimes pharmacists will contact me and say, "oh this patient can't take this medication for whatever reason," and then I will say, "actually that is not true, the reason I prescribed this is for this reason." And so just to save some time up front, I would like to be contacted in advance so that we could touch base, everybody is on the same page, and then once the pharmacist does the review, I personally prefer to be contacted directly and just to have this ongoing dialogue.

Note. SMAP = Saskatchewan Medication Assessment Program; eGFR = estimated glomerular filtration rate; ACE = angiotensin-converting enzyme.

and concerns were identified by the community pharmacists in this domain. Some had received derogatory comments from physicians regarding SMAPs, and frustrations were expressed with not hearing back from physicians after an SMAP had been completed and not knowing whether their suggestions had been implemented. Community pharmacist 6 stated,

Few doctors actually read the letters that we send. Doctors are often hostile to the process. I have had doctors tell patients, “these pharmacists who think they are doctors, and they don’t know what they’re talking about” . . . It is frustrating to spend, you know, five hours on a med review and have the doctor ignore it.

Only a few community pharmacists discussed communication and/or collaboration with the renal team and indicated that a better knowledge of their role would be helpful.

*Other challenges.* A wide range of challenges were discussed, including challenges with SMAP process ( $n = 9$ ), challenges with skills and inadequate training ( $n = 4$ ), challenges with time ( $n = 4$ ), and challenges with the forms ( $n = 4$ ). Some example quotes are provided below, and more can be found in Table 1.

- Community pharmacist 9: “Definitely people of First Nations heritage, who have coverage through NIHB, should have coverage through the Saskatchewan Medication Assessment Program and through the Saskatchewan Drug Plan. With the risk of sounding political, it’s just ridiculous that we are not including this population.”
- Community pharmacist 6: “I don’t think the training is enough. I have done the videos. I have done the CE’s. It is just not adequate, and even the 4th year students that we have had in the last couple of years are not properly trained. They don’t feel comfortable doing it.”
- Community pharmacist 2: “There is no limit to what you should know, and then you just sort of feel paralyzed . . . and so it just almost immobilizes you to do anything.”

*Suggestions.* All community pharmacists provided suggestions for improvement during their interviews, which are summarized across all health care providers in Table 2. Suggestions regarding process included revising the standardized SMAP forms, mechanisms for tracking drug-related problems, and expanding the eligibility criteria. Other suggestions included improving education for community pharmacists and incorporating better resources into the pharmacies for complex patients. One pharmacist shared the following advice for fellow community pharmacists: “I think the most valuable advice is to be proactive and

don’t be afraid of people saying no, just offer med reviews, and your patients will appreciate them. A lot of them just don’t know what they are.”

### Renal Pharmacists

Ten (5 from Saskatoon and 5 from Regina) participated in the interviews. The renal pharmacists ranged in age from 30 to 60, with a mean of 24 years in practice. Each had reviewed at least one (range = 1-6) SMAP forwarded to an attending nephrologist by a community pharmacist. Most ( $n = 8$ ) had reviewed at least 3 SMAP assessments over the past 3 years. Three categories emerged from the narratives with renal pharmacists.

*SMAP concerns.* Concerns from with SMAPs were identified from renal pharmacists, which were further divided into 3 subcategories.

*Renal patients have complex care needs.* All renal pharmacists mentioned that renal patients are complex (referenced 46 times), and their unique needs may be difficult to deal with in a community pharmacy setting. Renal pharmacist 1 stated, “They are complicated patients, on multiple medications, and a one-time snapshot doesn’t really tell the whole picture.”

*Duplication of service.* All of the renal pharmacists expressed concern that the SMAP process replicated the services provided by the renal team (sources = 10, references = 16). For instance, renal pharmacist 2 stated, “I don’t think it is relevant to do it when they are followed by an outpatient clinic regularly.”

*Negative experiences with SMAP program.* Negative experiences with the SMAP program were experienced by all renal pharmacists and referenced in 27 quotes. Inappropriate recommendations were the commonly cited reason (referenced 13 times), and several recalled examples. Renal pharmacist 4 stated, “. . . it was a recommendation for an ACE and this patient’s kidney function, I think their creatinine is in the 400-500s and their K is 5, so an ACE was not appropriate for this patient.”

*Various levels of comfort with SMAP program.* Three individuals were extremely uncomfortable with community pharmacists conducting medication reviews on renal patients, based on previous negative experiences. On the contrary, 2 renal pharmacists described more of a partnership and indicated being comfortable working with a community pharmacist they were familiar with. The remaining renal pharmacists indicated their comfort would increase if the community pharmacist had specific training and communication with the renal clinic had occurred prior to the medication review.

**Table 2.** Suggestions for Improving the SMAP Process Identified by Participants.

	Renal pharmacists	Nephrologists	Community pharmacists
Criteria	<ul style="list-style-type: none"> <li>– Remove age restrictions</li> <li>– Expand criteria to include NIHB patients and immigrants</li> </ul>	<ul style="list-style-type: none"> <li>– Remove age restrictions</li> <li>– Expand criteria to include NIHB patients and immigrants</li> </ul>	<ul style="list-style-type: none"> <li>– Remove age restrictions</li> <li>– Expand criteria to include NIHB patients and immigrants, caregivers, patients with dementia, patients who can't leave home and all complex patients</li> </ul>
Process			<ul style="list-style-type: none"> <li>– Update SMAP forms to make them less repetitive and easier to track drug-related problems<sup>a</sup></li> <li>– Improve training for community pharmacists and students</li> <li>– Increase resources in the pharmacy</li> <li>– Increase reimbursement for time spent</li> <li>– Improve auditing process</li> <li>– Increase education to physicians about the SMAP process</li> <li>– Be proactive with offering SMAP assessments to patients</li> </ul>
Communication	<ul style="list-style-type: none"> <li>– Increase communication between health care providers</li> <li>– Communicate with nephrologist or team before performing SMAP</li> <li>– Health care providers should be informed of changes</li> </ul>	<ul style="list-style-type: none"> <li>– Increase communication between health care providers</li> <li>– Communicate with nephrologist or team before performing SMAP</li> <li>– Health care providers should be informed of changes</li> </ul>	<ul style="list-style-type: none"> <li>– Increase communication between health care providers</li> <li>– Physicians should acknowledge when they have received the SMAP assessment and if the changes were implemented</li> </ul>
Areas to focus on during the SMAP assessment	<ul style="list-style-type: none"> <li>– Provide education</li> <li>– Assess for adherence</li> <li>– Medication reconciliation</li> <li>– Assess for duplication of therapy</li> <li>– Focus on managing nonrenal comorbidities (as many of the renal issues may already be managed)</li> <li>– Identify unusual doses</li> <li>– Focus on drug interactions</li> <li>– Look at lab trends vs individual results</li> <li>– Provide medication recommendations only when comfortable</li> </ul>	<ul style="list-style-type: none"> <li>– Provide education</li> <li>– Assess for adherence and communicate nonadherence to renal team</li> <li>– Identify drug interactions</li> <li>– Assess for appropriate dosing in renal failure (especially antibiotics)</li> <li>– Ensure the patients is not taking OTC or herbals that may adversely affect kidney function</li> <li>– Provide sick-day management strategies</li> <li>– Notify team if new medication is prescribed from another source</li> </ul>	<ul style="list-style-type: none"> <li>– Nonadherence can be a trigger for education</li> </ul>

Note. SMAP = Saskatchewan Medication Assessment Program; NIHB = noninsured health benefit list; OTC = over-the-counter medications.

<sup>a</sup>The SMAP standardized reporting forms have been updated by the Pharmacist Association of Saskatchewan since this study was completed.

**Barriers and improvements.** Renal pharmacists identified several challenges that could be associated with the SMAP process, which was further delineated according to 3 subcategories.

**Communication and collaboration.** Issues with communication were described in 6 interviews. For example, renal pharmacist 2 stated, “So I guess I would have to say I am not happy with it [the SMAP process] because there seems to be a lack of communication between the community pharmacist

and the renal pharmacist.” Despite the concerns and negative experiences, all renal pharmacists indicated that they valued collaboration with the community pharmacists regarding their mutual patients (10 sources, 18 references). Renal pharmacist 6 stated,

Sometimes there are medications that patients have before I even know about it, and there are things that the nephrologists don't deal with too. They [the nephrologists] like to have their hand in the blood pressure, but they like to leave pain



**Table 3.** Principles for Providing SMAPs in Complex Patients.

1.	A clear goal of the SMAP process should be to assist patients in navigating the complex health care system.
2.	Medication assessments should be viewed as an opportunity to optimize patient care, which may involve providing support and education to patients, and does not necessarily need to result in a recommendation.
3.	Medication changes should only be recommended if the drug-related issue clearly poses a risk to the patient and is thoroughly understood by the pharmacist. In situations where the pharmacist is not certain about the issue, an inquiry to the physician or health care team should be undertaken.
4.	All care providers should make efforts to improve communication, which in turn will lead to increased trust, collaboration, and optimal patient care.
5.	Changes in therapy resulting from medication assessments should be communicated with all care providers.

Note. SMAP = Saskatchewan Medication Assessment Program.

management and even diabetic management to family doctors, so I don't get involved in that as much . . . The community pharmacist is my partner, in that if they are sending other recommendations about some things to a family doctor that helps.

**Other challenges.** One renal pharmacist voiced concern that community pharmacists may feel pressure to perform SMAPs. Another discussed the limitations of SMAP coverage, while others indicated that patients do not always tell the community pharmacist that they are followed by other care providers, such as the renal team (2 sources). Multiple caregivers were also cited as a challenge by 2 renal pharmacists.

**Suggestions.** Several suggestions were provided on how SMAPs could potentially benefit renal patients, which are elaborated on in Table 2. These included checking for adherence, reconciling the patient's medications, assessing for duplication of therapy, identifying unusual dosages, focusing on drug interactions, focusing on other comorbidities unrelated to the renal disease, and looking for trends in lab results (each sourced once). According to renal pharmacist 8,

I have heard or discussed with pharmacists, they will look at one isolated value and make recommendations based on that . . . when we talk to them we try to teach to look at their trend. Perhaps this was a blip, perhaps they were dry, perhaps they were and so on.

The renal pharmacists agreed that it is important to be comfortable and confident before making recommendations. Renal pharmacist 6 stated,

If you as a pharmacist aren't comfortable with the knowledge that you have—for example, my knowledge with transplant patients isn't necessarily what the transplant pharmacists have—so I recognize that. I wouldn't necessarily make recommendations for transplant patients without knowing what I need to know before making that recommendation.

### Nephrologists

Of the 14 nephrologists identified, 8 nephrologists were interviewed, including 7 from Saskatoon and 1 from Regina.

The nephrologists ranged in age from 30 to 60, with a mean of 44 years in practice. Five of the nephrologists could not recall seeing any SMAPs, while 2 had reviewed 1 or 2. Another nephrologist, who practiced in close proximity to a community pharmacy, often received SMAPs and reported seeing approximately 70 in the previous year. Four categories were identified in the interviews, and many of the opinions were similar among those who had seen an SMAP and those who had not. However, it is worth noting that only 5 had actual “lived experiences” with the medication assessments.

**SMAP concerns.** Similar to the renal pharmacists, concerns were identified under the subcategories of complex care needs and duplication of service.

**Renal patients have complex care needs.** Unique needs of renal patients were sourced in all 8 interviews and referenced 13 times. Nephrologist 2 stated,

Well burden of disease number one, plus comorbidities. So there is a unique set of medications that are exclusive or almost exclusive to renal patients, you know, right from the Replavite to Eprex to their One-Alpha . . . I think dosages are often not always well understood and not always just in the end-stage kidney disease population, but the understanding that someone with a creatinine of 150 could still have a GFR of 30, which is why their Cipro is only 500 mg once daily rather than twice a day or why they shouldn't be on metformin.

**Duplication of service.** All nephrologists discussed their concerns for potential duplication of service with the SMAP process. According to nephrologist 1, “I think we have great pharmacists here, and we don't need someone else doing their job . . . I think it is almost like a duplication of service.”

**Relationship with pharmacists.** Regarding the relationships between the nephrologists and pharmacists, 2 subcategories emerged:

**Appreciation for renal pharmacists.** All nephrologists mentioned that they have access to renal pharmacists (sources = 8, references = 12), and many expressed appreciation for

their services. According to nephrologist 5, “We have our pharmacists already involved, and we trust our pharmacists. They are all excellent, well trained and they are working with that very small subset of patients, transplant and dialysis patients, and it is a different pharmacological world.”

*Uncertainty about community pharmacist’s skills.* Meanwhile, 6 of the nephrologists expressed concern that community pharmacists may not be equipped to perform SMAPs in renal patients: According to nephrologist 1, “I think that all the workings and understandings of renal patients and renal failure patients is so complex that a community pharmacist just doesn’t have a hold on the completeness of treatment of renal disease.”

*Various levels of comfort with SMAP process.* The nephrologists had mixed comfort levels with the SMAP program. Some nephrologists spoke highly of the program (n = 2). For instance, one nephrologist with experience with the program said,

there is certainly no harm. I think it is a great program, and I am very supportive of the [community] pharmacists doing this because I think it is an additional safety net. They pick things up, and you know if you don’t agree with the recommendations . . . I guess it is more paperwork and that is it. But I think that it is doing a lot of good for patients.

Six nephrologists had mixed comfort levels with the SMAP process. One nephrologist correlated her comfort level to the personal relationship with the pharmacist:

. . . [I am] maybe comfortable and maybe not comfortable, and mostly because I really don’t know the level of knowledge of the community pharmacist in regards to people who have renal disease. I think for some of the pharmacists that I know that do them, [I am] extremely comfortable—and I am not just talking about the CKD Clinic or in Transplant—I am talking in the community where I know the pharmacist. But where I don’t know the pharmacist I would be uncomfortable.

While the nephrologists described their comfort working with renal pharmacists, most expressed hesitation toward receiving recommendations from community pharmacists unless they received specialized training. Interestingly, nephrologists did not have a clear understanding of the community pharmacist’s role or what the community pharmacist could contribute to patient care.

*Barriers and improvements.* Barriers and suggestions for improvement were mentioned throughout the interviews (Table 2).

*Communication and collaboration.* All nephrologists emphasized the need for collaboration and communication with the community pharmacists (sourced in 8 interviews, referenced

in 27 quotes). Four nephrologists specifically indicated they would prefer communication with the community pharmacist to occur before the SMAP. One suggestion was for the community pharmacist to initiate communication before the medication review is performed, to gather more context on the clinical situation. Nephrologist 2 stated,

I think before they [the community pharmacist] actually made recommendations, it would be nice if they discussed them with the nephrologist before they actually say to the patient, “you know you should stop the ACE inhibitor.” Because maybe there might be very good reasons why I have them on an ACE inhibitor, so rather than confusing the patient there should be more communication up front or prior to recommendations being done . . . I would hope the community pharmacists aren’t so afraid of calling the nephrologist to ask information because I suspect some of them are.

All 8 nephrologists discussed the desire to improve collaboration with the community pharmacist by using different phrases such as “working together,” “collaboration,” and “communication.” As summarized by one nephrologist,

I think in patients that are complex, we need to work with the pharmacy like a team whether it is community or hospital-based. I am specialized in kidney and if that pharmacy wants to work with complex patients, then they should probably have more training in diabetes or kidney, or hypertension or Parkinson’s or whatever the area is.

*Other suggestions.* Nephrologist 2, in particular, identified several suggestions:

I think that the benefits of this program outweigh the non-benefits, but I think the program needs to be changed, and lots of the change needs to involve communication between the healthcare providers and sort of outreach to the marginalized patients.

This nephrologist also expressed concern over the restrictive age criteria and the fact that the current program does not capture marginalized patients such as First Nations people, immigrants, and refugees.

Two nephrologists indicated that it would be of great benefit if the community pharmacist could provide adherence information to the renal team. One nephrologist stated she would like to see community pharmacists providing patient education on sick-day management, while a transplant nephrologist suggested that it would be helpful for pharmacists to inform the team when new medications were prescribed from another source (such as a family physician or walk-in clinic).

## Discussion

We performed a qualitative analysis to investigate health care provider perceptions of the SMAP program in renal

patients. Participants in this study reported both benefits and challenges. Our discussion will focus on the challenges and speculate on potential principles that should be incorporated when providing SMAP assessments in renal patients and complex patients in general (Table 3).

The importance of communication and collaboration was emphasized by all health care providers and individuals from each group indicated that there is room for improvement in this domain. Some community pharmacists did not know that renal patients are followed by a multidisciplinary team that includes a renal pharmacist. In other cases, community pharmacists may not understand the role the renal pharmacist played. These observations potentially identify a critical gap in the SMAP process. Some pharmacists may not understand the various care providers and health services being used by their SMAP patients. If the SMAP process is being conducted without first understanding the context of care, pharmacist recommendations may actually be adding complexity rather than improving care. Optimization of care does not necessarily require an independent set of clinical recommendations. A clear goal of the SMAP process should be to assist patients in navigating the complex health care system, including clarifying the roles of general practitioners (GPs), specialists, nurse practitioners, and other pharmacists (Table 2, principle 1).

Pharmacists in our study placed a high value on “making recommendations.” Both community and renal pharmacists (with the exception of 2 community pharmacists) suggested either directly or indirectly that the ultimate goal of the medication reviews was to provide a recommendation for change. Indeed, pharmaceutical care is built on the philosophy of identifying a drug-related problem and making recommendations to the patient’s physician and other health professionals in the circle of care.<sup>14</sup> In contrast, the SMAP program policy statement in Saskatchewan does not include any statements alluding to making a recommendation. Perhaps some pharmacists feel an expectation to make recommendations on every SMAP encounter, even for patients with unique needs. In a previous study about the SMAP process, some community pharmacists indicated that they have trouble identifying drug-related problems because they do not have enough of the patients’ medical history (67.2%,  $n = 131/195$ ), even in the general population.<sup>4</sup>

Pressure to make a recommendation could be a contributor to poorly considered recommendations such as those identified by the renal pharmacists. In our view, poor recommendations pose a serious threat to the reputation of medication assessment programs and community pharmacists in general. Although recommendations often serve as evidence of work or tangible measures of workload,<sup>15</sup> objective outcomes such as providing individualized patient education should be a major target.<sup>16</sup> Perhaps it is time to reexamine our definition of “patient benefit.” According to the community pharmacists we interviewed, patients truly seem to value the service. As the most accessible health care provider,

community pharmacists are in a prime position to provide education to patients, specifically those who suffer from chronic conditions or those taking several medications. Education can result in improved adherence and better medication-taking qualities.<sup>16-18</sup> Perhaps the SMAP process should emphasize discussions that facilitate self-management, rather than focusing on making medical recommendations (Table 2, principle 2).

While all participants felt that communication and collaboration was important in the provision of best patient care, all agreed that the current SMAP process does not encourage collaboration in an effective way. Nephrologists suggested it would be helpful for the community pharmacist to initiate communication before the medication review is performed, to gather more context on the clinical situation, and indicated they were more comfortable with the SMAP assessments when they knew the pharmacists. Meanwhile, community pharmacists expressed that “communication is a 2-way street” and that sometimes interactions with physicians can be difficult. Frustrations were expressed with not hearing back from physicians after an SMAP had been completed, and not knowing whether their suggestions had been implemented. These observations indicate that care providers should make efforts to improve communication, which in turn will lead to increased trust, collaboration, and optimal patient care (Table 2, principle 3). Furthermore, changes in therapy resulting from medication assessments should be communicated with all care providers so that everyone is in the loop (Table 2, principle 4), and medication changes should only be recommended if the drug-related issue clearly poses a risk to the patient and is thoroughly understood by the pharmacist. In situations where the pharmacist is not certain about the issue, an inquiry to the physician or health care team should be undertaken (Table 2, principle 5).

Both renal pharmacists and nephrologists identified duplication of service as a major concern, especially amid the budget cuts and the implementation of the lean philosophy (lean is a patient-focused approach to reducing waste by identifying and eliminating activities that do not add value, that was previously adopted by the Saskatchewan Ministry of Health during the time of this study) in Saskatchewan. In essence, many renal pharmacists are routinely providing medication reviews already, by nature of their role on the interprofessional team. We speculate that implementing a mechanism to formally acknowledge the renal pharmacist’s medication reviews could prevent duplication of service by the community pharmacist. As the renal pharmacists within the health region have no means of billing for the SMAP service, another process would need to be created to indicate that an SMAP has been performed. However, to formally recognize the medication assessments performed by renal pharmacists, they would likely benefit from additional education on the SMAP process and required documentation. Furthermore, communication is a 2-way street; the renal pharmacist would be responsible for sharing the SMAP with

the patient's community pharmacy and family physician in the same manner the renal team expects communication from the community pharmacy.

The limitations of this study should be acknowledged. Although every effort was made to include all nephrologists and renal pharmacists in Saskatoon and Regina, not everyone participated. Five of the nephrologists who opted to participate had never seen an SMAP, which could be seen as a limitation. Nevertheless, this finding in itself is significant as it indicates that although SMAPs are being performed, nephrologists are not receiving them, which led us to recommendation 5: "Changes in therapy resulting from medication assessments should be communicated with all care providers."

The small sample size per subsample group is another notable limitation of this study. Recruiting community pharmacists for this study was challenging. First off, it was impossible to determine up front which pharmacists and/or pharmacies had most experience performing SMAPs on renal patients, specifically, and many of the responses from the pharmacists were about complex patients in general. Second, our first method of recruitment (sending faxes to pharmacies) was unsuccessful, so we resorted to personally asking specific community pharmacists to participate. While this type of purposive sampling was not our first choice, it is an acceptable method of recruitment in qualitative research.<sup>12</sup> We strived to achieve an adequate representation of pharmacists with respect to gender, location (rural and urban), and age. However, it should be noted that the perceptions of the community pharmacists in this sample may not adequately reflect the views of all community pharmacists in Saskatchewan.

The interviews were conducted by A.A., a researcher, who is also a community pharmacist, and this could be perceived as both a limitation and a strength. On one hand, A.A. may have unintentionally used her own personal bias to guide the questions in a way that influenced the results. On the other hand, A.A.'s experience with the SMAP process likely allowed her to delve deeper into specific topics and to provide a level of understanding that would not have been possible if the interviewer had no familiarity with the process. To minimize the potential for bias, the research team also comprised renal pharmacists as well as external members with no internal knowledge of the SMAP process in renal patients.

Finally, the intent of the project was to explore health care providers' perceptions. We acknowledge that the lack of renal patient perceptions on the SMAP is an important limitation of this study. Further research should explore the patient perspective and aim to perform a quality appraisal of SMAP recommendations.

## Conclusion

We undertook a qualitative analysis to explore the perceptions of health care providers involved in the SMAP process involving complex renal patients in Saskatchewan. Despite

some negative experiences, none of the participants we interviewed believed the program should be eliminated. Several concerns were identified that suggest program modification may help to avoid duplication, improve communication, and maximize benefits.

## Ethics Approval and Consent to Participate

The study was approved by the University of Saskatchewan Behavioral Research Ethics Board (REB), and operational approval was granted by the governing health authorities.

## Consent for Publication

All authors reviewed the final manuscript and provided consent for publication.

## Availability of Data and Materials

Data and materials may be made available upon written request to the corresponding author. Reasonable requests for data access will be assessed in consultation with the appropriate Research Ethics Boards.

## Acknowledgments

The authors would like to thank all of the participants who took time out of their busy schedules to participate in this study and share their thoughts.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

## Supplemental Material

Supplemental material for this article is available online.

## References

1. Pammett R, Jorgenson D. Eligibility requirements for community pharmacy medication review services in Canada. *Can Pharm J (Ott)*. 2014;147(1):20-24.
2. Pharmacy Association of Saskatchewan. Saskatchewan Medication Assessment Program. <https://www.skpharmacists.ca/site/smap>. Accessed October 5, 2020.
3. 2019 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2019 updated AGS beers criteria® for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2019;67(4):674-694. doi:10.1111/jgs.15767.
4. Currie K, Evans C, Mansell K, Perepelkin J, Jorgenson D. Community pharmacists' experiences with the Saskatchewan Medication Assessment Program. *Can Pharm J (Ott)*. 2019; 152(3):193-203.
5. Pechlivanoglou P, Abrahamyan L, MacKeigan L, et al. Factors affecting the delivery of community pharmacist-led medication reviews: evidence from the MedsCheck annual service in Ontario. *BMC Health Serv Res*. 2016;16(1):666.

6. Stemer G, Lemmens-Gruber R. Clinical pharmacy activities in chronic kidney disease and end-stage renal disease patients: a systematic literature review. *BMC Nephrol*. 2011;12(35):1-12.
7. Cabello-Muriel A, Gascon-Canovas J, Urbieto-Sanz E, Iniesta-Navalón C. Effectiveness of pharmacist intervention in patients with chronic kidney disease. *Int J Clin Pharm*. 2014;36(3):896-903.
8. Bradshaw C, Atkinson S, Doody O. Employing a qualitative description approach in health care research. *Glob Qual Nurs Res*. 2017;4. doi:10.1177/2333393617742282.
9. Hyejin K, Sefcik J, Bradway C. Characteristics of qualitative descriptive studies: a systematic review. *Res Nurs Health*. 2017;40(1):23-42. doi:10.1002/nur.21768.
10. Henrich N, Tsao N, Gastonguay L, Lynd L, Marra CA. BC Medication Management Project: perspectives of pharmacists, patients and physicians. *Can Pharm J (Ott)*. 2015;148(2):90-100.
11. Dolovich L, Gagnon A, McAiney CA, Sparrow L, Burns S. Initial pharmacist experience with the Ontario-Based Meds Check Program. *Can Pharm J (Ott)*. 2008;141(6):339-345.
12. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm Policy Ment Health*. 2015;42(5):533-544.
13. Lindgren BM, Lundman B, Graneheim UH. Abstraction and interpretation during the qualitative content analysis process. *Int J Nurs Stud*. 2020;108:103632. doi:10.1016/j.ijnurstu.2020.103632.
14. American Pharmacists Association. Principles of practice for pharmaceutical care. <https://www.pharmacist.com/principles-practice-pharmaceutical-care>. Published 2017. Accessed October 30, 2018.
15. Farris K, Fernandez-Llimos F, Benrimoj SI. Pharmaceutical care in community pharmacies: practice and research from around the world. *Ann Pharmacother*. 2005;39(9):1539-1541.
16. Raman-Wilms L. The pharmacist as patient educator. *Can J Hosp Pharm*. 2009;62(2):93-98.
17. Bajcar J. Task analysis of patients' medication-taking practice and the role of making sense: a grounded theory study. *Res Social Adm Pharm*. 2006;2(1):59-82.
18. World Health Organization for Europe Copenhagen. Therapeutic patient education. [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/145294/E63674.pdf](http://www.euro.who.int/__data/assets/pdf_file/0007/145294/E63674.pdf). Published 1998. Accessed October 30, 2018.