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Original Article

Barriers and Facilitators to Using Statins: A Qualitative Study With Patients and Family Physicians

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ABSTRACT

Background: Despite their proven efficacy to reduce cardiovascular disease, statin medication use remains low in individuals at high risk of cardiovascular disease considering their widespread availability and safety. Our objective was to explore the perspectives of patients and family physicians with regard to the barriers and facilitators of statin use in primary care.

Methods: In this qualitative descriptive study, we conducted 2 focus groups with patients (number, n = 8/6) and individual semistructured interviews with family physicians (n = 17) from community settings. Interviewers asked participants about barriers to and facilitators of statin use. Focus groups and interviews were digitally recorded, transcribed, and analyzed in duplicate using conventional content analysis.

Results: Patients were averse to taking statins for a variety of reasons: medication avoidance and burden; inadequate buy-in for statin therapy; and difficulty remembering to take statins regularly. Family physicians

RÉSUMÉ

Introduction : En dépit de leur efficacité prouvée pour réduire les maladies cardiovasculaires, l'utilisation des statines reste faible chez les individus exposés à un risque élevé de maladies cardiovasculaires si l'on considère leur grande disponibilité et leur innocuité. Notre objectif était d'examiner les perspectives des patients et des médecins de famille en ce qui concerne les obstacles et les facilitateurs de l'utilisation des statines en soins primaires.

Méthodes : Dans la présente étude qualitative descriptive, nous avons mené 2 groupes de discussion composés de patients (nombre, n = 8/6) et des entrevues semi-structurées individuelles avec des médecins de famille (n = 17) en milieu communautaire. Les intervieweurs ont demandé aux participants quels étaient les obstacles et les facilitateurs de l'utilisation des statines. Les groupes de discussion et les entrevues étaient enregistrés numériquement, transcrits et analysés en duplicata à l'aide de l'analyse de contenu traditionnelle.

Dyslipidemia affects one-third of the general population and is a major risk factor for atherosclerotic cardiovascular disease (CVD).[1-3] Dyslipidemia accounts for almost half the population-attributable risk of myocardial infarction and one-quarter the risk of stroke.[2,3] Statins are a class of medications that were designed to lower cholesterol levels in patients with dyslipidemia.[4] There is robust evidence that treatment of dyslipidemia with statins in individuals who have a history of established CVD such as myocardial infarction, ischemic stroke, or peripheral artery disease (ie, secondary prevention populations) reduces recurrent CVD events and mortality.[5-8] The benefits of statins in those who do not have established CVD (ie, primary prevention) is somewhat more debatable.[9] However, the Canadian Cardiovascular Society and other groups have designated some individuals as being at high

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Ethics Statement: The present research has adhered to the relevant ethical guidelines.

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perceived similar barriers and reported other barriers: lack of resources such as inadequate tracking systems; specialist-primary care provider guideline discordance; and lack of continuity and relationship. Patients expressed that key facilitators were patient education and support; splitting tablets to increase cost-effectiveness; and changing to a different statin or lower dose in those with side effects. Family physicians described several similar strategies to facilitate therapy as well as shared decision making and clinical decision support tools as enablers for improvement.

Conclusions: We identified several important barriers to and facilitators of statin use at the patient and prescriber level. This information offers insight into strategies to improve statin use and the development of innovative programs and interventions.

Résultats : Les patients se sont opposés à la prise de statines pour plusieurs raisons : l'évitement et le fardeau des médicaments, l'adhésion insuffisante au traitement par statines et la difficulté à se souvenir de prendre régulièrement les statines. Les médecins de famille ont perçu des obstacles similaires et ont rapporté d'autres obstacles dont le manque de ressources telles que les systèmes de suivi inadéquats, la divergence entre les orientations des spécialistes et des prestataires de soins primaires, et le manque de continuité et de relation. Les patients ont exprimé que les principaux facilitateurs étaient l'éducation et le soutien offerts aux patients; le fractionnement des comprimés pour améliorer l'efficience; le changement vers une statine différente ou une dose plus faible chez ceux qui présentent des effets secondaires. Les médecins de famille ont décrit plusieurs stratégies semblables pour faciliter le traitement ainsi que la prise de décision partagée et les outils d'aide à la décision clinique qui facilitent l'amélioration.

Conclusions : Nous avons déterminé plusieurs obstacles et facilitateurs importants de l'utilisation des statines au point de vue du patient et du prescripteur. Ces informations offrent un aperçu des stratégies pour améliorer l'utilisation des statines et l'élaboration d'interventions et de programmes innovateurs.

enough risk for CVD (due to underlying conditions such as diabetes or chronic kidney disease) that statin therapy is warranted.[10,11] There is evidence to support that in these populations, the benefits of statins approximates that conferred upon those with established CVD, and therefore they have been designated "statin-indicated conditions."[1,10,12,13] Randomized controlled trials and meta-analyses also show that treatment with statins lowers CVD and mortality in these groups irrespective of baseline features including baseline cholesterol level, treated hypertension, body mass index, systolic or diastolic blood pressure, and smoking status.[8,14,15] Despite this robust evidence, treatment rates with statins are suboptimal in those with statin-indicated conditions.[10,16-18]

Studies have shown that only 23%-65% of people with 1 or more statin-indicated conditions are receiving this therapy and 50% of those who do take them are not fully adherent.[10,16-18] Many patients who should be on a statin have never been prescribed them or are not currently taking them, even though statins are efficacious, safe, and cost-effective.[10,16,19-21]

Both patient and physician factors contribute to undertreatment with statins. Most patients are asymptomatic from their dyslipidemia, making it easy to disregard. Physicians may face clinical inertia, competing clinical demands (ie, managing dyslipidemia, blood pressure, smoking cessation, etc.), or they may have inaccurate perceptions of patients' risk.[22-24] In the development of tools and strategies to optimize CVD prevention and treatment, it is important to have the input of key stakeholders, namely patients and physicians, before the development and implementation of any strategy rather than one that relies solely on one stakeholder group's feedback alone. Although a few studies have documented patient barriers, less is known about the challenges prescribers experience, their common reasons for not prescribing statins, or the challenges they encounter when they do prescribe statins.[25,26] Qualitative methods allow for a deeper understanding of perspectives that in turn can be leveraged to develop tailored strategies taking into account those perspectives that may improve an intervention's effectiveness and acceptability by both patients and physicians. As such, our objective was to explore the perspectives of patients and family physicians (FPs) with regard to the barriers to and facilitators of statin use.

Material and Methods

Study design

We used a qualitative descriptive study to explore patients' and FPs' perspectives on barriers to and facilitators of statin use.[27] This study was conducted in Calgary, Alberta (population approximately 1.3 million), which has province-wide universal health care insurance including coverage for physician, hospital, and laboratory services. In Alberta, there is no universal pharmacare program except for some government-sponsored (ie, premium free) programs (ie, low-income residents, people $\geq$ 65 years of age, etc.).[28,29] We used the Standards for Reporting Qualitative Research as the reporting framework for this study.[30]

Participant selection

Patients were recruited to participate in focus groups using convenience sampling. Patients were recruited through posters in various clinical spaces as well as inviting patients who are part of an established cardiovascular health advisory panel who had agreed to be contacted about research opportunities for study participation.[31] Patients who met the following criteria were eligible: (1) age $\geq$ 18 years and (2) potential recipients of statins (ie, those with statin-indicated conditions such as history of CVD, diabetes, and/or chronic kidney disease).

FPs were recruited to participate in individual interviews, using purposive sampling.[32] We used snowball sampling techniques to identify eligible FPs.[33] First, by engaging key stakeholders in areas of primary care, endocrinology, nephrology, and cardiology affiliated with academic hospitals,

we asked them to recommend community-based FPs to participate in the study. Individual FPs were then sent an invitation to participate. The study was also advertised at an FP conference and through social media sites frequented by this group. FPs who met the following criteria were eligible: (1) currently practicing in community primary care settings and (2) had at least 1 year of experience as an FP. Participants were sampled purposively based on several key demographic characteristics: age, gender, and type of clinical practice.

Data collection

We developed a focus group guide and an open-ended semistructured interview guide based on a review of the literature and discussion with the research team (Supplemental Appendix S1). We intentionally used interviews for data collection with FPs due to difficulty recruiting them to focus groups because of their competing clinical demands and time constraints. Focus groups were face-to-face meetings (facilitated by D.J.T.C., R.C.W.L.-K., and S.B.), and interviews were conducted in-person or via telephone by a trained research assistant (R.C.W.L.-K.) with oversight by experienced study team members (D.J.T.C. and S.B.). FPs were not previously known to the study team, and none of the patients were under the care of the study team. FP interviews were continued until the point of theoretical saturation when no new information emerged from the interviews.[34] Because the research objective was relatively focused, interviews were brief and lasted approximately 30-45 minutes. For the patient focus groups, we convened small groups of 6-8 patients and each group lasted approximately 90 minutes. Interviews and focus groups were audio-recorded and then transcribed verbatim and independently by a professional transcriptionist. Data were collected from September 2018 to November 2018.

Data analysis

Analysis was completed using conventional qualitative content analysis, a method of interpreting interview data with the goal of describing the phenomenon of interest.[35] Transcripts for the first focus group and the initial 3 interviews were reviewed (D.J.T.C., R.C.W.L.-K., and S.B.), with the objective of establishing a preliminary coding template that was used for subsequent analysis. All transcripts were then analyzed by 2 reviewers (D.J.T.C. and R.C.W.L.-K.). Codes were generated from the interview and focus group data and systematically applied to identify themes and patterns. The process was iterative, reflexive, and interactive as continual data collection and analysis shaped each other. For example, code titles or definitions identified based on earlier interviews were modified according to the data collected during subsequent interviews. Once all transcripts were initially coded, the team met together to review the coding to elicit discussion about the coding strategy and attempted to achieve consensus to resolve coding discrepancies, and to merge individual codes into overarching themes. Data analysis was supported by NVivo 12 software (QRS International, Doncaster, Australia).

Ethics approval was granted from the University of Calgary (Ethics #REB17-23994). Written signed informed consent was received from each study participant. Gift cards were provided to all participants.

Table 1. Description of patient participants in 2 focus groups (n = 8/6)*

Patient characteristics	Total (%)
Age (y)	
<40	2 (15)
40-60	5 (39)
>60	6 (46)
Gender	
Men	6 (46)
Women	7 (54)
Statin-indicated condition	
None/high cholesterol only	3 (23)
Diabetes only	6 (46)
Myocardial infarct (MI) only	1 (8)
Diabetes and MI	3 (23)
Stroke	0
Chronic kidney disease	0
Have a primary care provider	
Yes	12 (92)
No	1 (8)
Followed by a specialist physician	
Yes	10 (77)
No	3 (23)
Aware of high cholesterol levels	
Yes	11 (85)
No	2 (15)
Current use of statin medication	
Yes	6 (46)
If not, had spoken with physicians about statins	3 (23)
If not, had not spoken with physicians about statins	4 (31)
Insurance coverage for medications	
Yes	6 (46)
No	7 (54)

*Note that 1 participant did not complete a demographics questionnaire.

Results

Participant demographics

We conducted 2 focus groups (FG) with 14 patients (P) (number, n = 8/6). There was a similar distribution of men and women (with a wide range of ages) participating (Table 1). Patients had a variety of indications that would qualify them for statin use in CVD, diabetes, familial hypercholesteremia, or isolated elevated cholesterol. We reached theoretical saturation after 17 individual semistructured interviews with FPs (Table 2). FPs provided clinical care in a broad variety of practice settings including urban, rural, indigenous communities, varied socioeconomic catchments, and refugee-focused practices.

We have categorized the themes and subthemes that we discovered into barriers and facilitators. Patients and primary care providers (PCPs) had common perspectives for some barriers and facilitators, but not for all (Tables 3 and 4).

Barriers

Several major themes emerged from the patients and FPs regarding barriers to statin use (Table 3).

Medication avoidance and burden. Both patients and FPs commented that general aversion to pills was a major reason that patients may not take statins. Although patients were generally aware of the benefits of statin therapy, some were

Table 2. Description of family physicians (n = 17)

Family physician characteristics	Total (%)
Age (y)	
<40	13 (76)
40–60	4 (24)
Gender	
Men	2 (12)
Women	15 (88)
Years of primary care practice	
< 10	14 (83)
≥ 10-20	3 (18)
Years since medical school graduation	
< 10	11 (65)
≥ 10	6 (35)
Primary Care Network membership*	
Yes	15 (88)
No	2 (12)
Location of primary care practice	
Urban	13 (76)
Rural	4 (24)
Subspecialty interest	
Yes†	9 (53)
No	8 (47)
Clinical practice last 12 mo	
Number of patients with statin-indicated condition	
< 20	1 (6)
20-99	7 (41)
≥ 100	9 (53)
Use of endocrinology consultation services	
Yes	5 (29)
No	12 (71)
Use of cardiology consultation services	
Yes	10 (59)
No	7 (41)
Use of nephrology consultation services	
Yes	3 (18)
No	14 (82)

*Primary Care Network: formal group of family physicians and allied health care professionals such as nurses, nurse practitioners, dieticians, and social workers.

†Subspecialty types: elderly care (n = 2), emergency medicine (n = 1), urgent care (n = 1), refugee medicine (n = 1), obstetrics (n = 2), indigenous health (n = 2), lactation medicine (n = 1).

fearful of potential side effects, which was fuelled by media or family members/friends who had experienced side effects. Furthermore, patients who initiated statin therapy and experienced side effects (eg, myalgias) themselves were often hesitant to continue or restart treatment. Results from both participant groups also indicated that some patients simply preferred health behaviour modification only over medical therapy to reduce cholesterol levels with a patient commenting on their preference for: "… an hour walk every day" (FG2, P6).

Although most FPs perceived statins to be a medication that should be affordable for patients, several patients were concerned about the costs. In cases where polypharmacy is an added burden, one patient commented that "if you already have another cost with medication … the problem [is] how this bill will affect other problems that you have" (FG2, P4). Results further suggested that because many patients who are started on statins have indications for a variety of other medications, the burden of these pills was a struggle:

Table 3. Patients' and family physicians' barriers to statin use

Themes	Subthemes
Medication avoidance and burden	General aversion to pharmaceuticals
	Concerns for side effects (ie, fear of, perceived, experienced)
	Preference for lifestyle changes
	Pill burden or financial barriers*
Inadequate buy-in for statin therapy	Not convinced of statin benefit
	Misconceptions about statins
	Lack of acceptance of diagnosis/indication for treatment
Difficulty remembering to take medication regularly	Forgetting daily statin dose
	Lacking a sense of importance of statin therapy
Lack of support resources†	Unable to track patients who have statin indications
	Difficulty risk stratifying patients
Specialist-primary care provider guideline discordance†	Guideline discordance on cholesterol management
	Unclear role of follow-up lipid testing once on therapy
	Questionable benefit of statin treatment in specific patient groups
Lack of continuity and relationship†	Loss to follow-up
	Limited appointment time
	Weak therapeutic relationship
	Not being patient's regular primary care provider

*Identified by patients only.
†Identified by family physicians only.

> just the mentality of having to take yet another pill sort of thing… I didn't know I had to take it for the rest of my life…now the diabetes, have to take another pill, and like if I had to another pill I'd be like 'oh my god'. (FG2, P3)

Inadequate patient "buy-in" for statin therapy. The difficulty of getting patients to "buy-in" to their need for statin therapy was identified by both patients and FPs, as another barrier. Several factors were cited as reasons why patients remained unconvinced about the benefits of statin therapy. First, some patients acknowledged that this was because they were asymptomatic with respect to their dyslipidemia: "…so slow, the process I mean the effects, I mean you could be out of whack for 40 years, you don't know how much damage you're doing to yourself" (FG1, P4). Similarly, FPs noted that because patients do not feel a benefit of statin therapy, they are more reluctant to take them: "they [patients] obviously can't feel the day-to-day benefit in it and so they may miss a few days or stop taking it 'cause they're not feeling better on it" (Female, FP #3). Another PCP described that patients may be hesitant to acknowledge that they have a chronic medical condition: "I guess labelling them 'sick' and having to take a pill every day [is unattractive to some patients]" (Female, PCP #4).

Difficulty remembering to take statins regularly. Collectively, patients and FPs agreed that simply forgetting to take the daily statin dose often leads to reduced adherence.

Table 4. Patient and family physicians' facilitators to statin use

Themes	Subthemes
Patient education and support	Family physicians emphasizing importance and benefits of statin
	Consulting trusted health information sources (ie, online, health professionals, pharmacy)
	Speaking with family/friends about their experiences with statins*
Shared decision-making process†	Listening and understanding patient concerns
	Managing patient expectations for statin efficacy
	Building patient rapport
	Using shared decision-making tool
	Collaborating with specialists and allied health providers
	Attempting health behaviour change with no improvement in lipid levels
Clinical decision support†	Electronic tools for tracking patients and indications (eg, electronic medical record systems)
	Risk stratification tools/applications
	Clinical guidelines
	Practice audits
Strategies to overcome patient resistance	Prescription strategies:
	Emphasis on tolerable dose rather than treating to target*
	Splitting tablets to increase cost-effectiveness*
	Changing statin drug type and/or dosage
	Medication review and deprescribing medications†
	Dispensation method (eg, blister packs)
	Using nonstatin lipid-lowering agents†
	Nonprescription strategies:†
	Plan for scheduled follow-up visits to review repeat lab testing
	Provide prefilled lab requisitions

*Identified by patients only.
†Identified by family physicians only.

Findings from focus groups also suggested that patients who did not take statins regularly also did not report experiencing any noticeable harms from this omission, which perpetuated the view that it can be missed: "I forget about a third of the time…it ties in with it's not like having something where you're on for a couple of days, you really notice the impact" (FG2, P1). A patient even expressed a desire for a simpler mode of administration that would not necessitate remembering to take it daily: "I wish it was just something I could inject in myself and it could for like I don't know a couple of months instead of taking a pill everyday" (FG1, P6).

Lack of resources to identify those with statin indications. In addition to the barriers that patients face to taking statins, FPs acknowledged that challenges within their clinical practice might hinder prescribing statins to those who would benefit. One of these barriers is a lack of resources to identify indications for statin therapy among FPs' patient population. Many FPs gave examples about the inadequacy of electronic health record systems for tracking individuals who have statin-indicated conditions such as CVD or diabetes. Furthermore, several physicians described the process of conducting risk stratification calculations to be onerous and cumbersome:

> Often, I have lots of other acute issues that I'm dealing with and you know doing, doing that score during a visit is often a bit burdensome, especially if I think the buy-in from the patient is going to be extremely low. (Female, PCP #14)

Specialist-primary care provider guideline discordance in patient care. Several FPs mentioned that discordance between "primary care" and "specialist" guidelines was a barrier to prescribing statins. In particular, they noted that there are discrepancies with respect to the indications for statin therapy; in some cases, "specialist" guidelines say that therapy is indicated, whereas "primary care" guidelines argue against its use. We found that in cases of individuals at lower cardiovascular risk, many FPs were inclined to take the more conservative approach to prescribing: "[For] primary prevention, I would certainly tell them if they meet the criteria to consider treatment. I don't necessarily really push it on them if they're in the lower category…" (Female, FP #4).

Beyond discrepancies in indications for statin therapy, the specialist-FP guideline discordance was especially noticeable with respect to the debate surrounding the need to treat cholesterol levels to prespecified target levels, as opposed to an approach where a dose of statins is provided to patients without further testing or dose adjustment:[36]

> …I think now it's coming out that cardiologists at least want LDLs to be driven down low, like as low as possible but that seems that to me is quite a newer thing.... (Female, FP #15)

Lack of continuity and relationship. The relationship between FPs and their patients is an important contributor to patients being willing to take statins. FPs cited the following contributors to lack of continuity and relationship: limited appointment time, suboptimal therapeutic relationships, and when doctors were not the patient's primary/regular FP (ie, walk-in clinic physician, locum). Another factor that physicians identified included loss to follow-up as another key barrier with contributing factors being the number of steps needed for patients to receive a diagnosis, proper management, and adequate follow-up:

> … in instances where it is identified, that they have dyslipidemia and it's confirmed on repeat testing… just the multiple steps, getting them to come in, discuss the [lab] results, the attempt of lifestyle changes and then repeat testing to see if the lifestyle changes have the appropriate impact… there's many points at which patients fail to actually follow through with… booking an appointment or having blood work done, that so far is the biggest barrier I've come across.... (Female, FP #8)

Facilitators

Study participants also highlighted several facilitators and strategies to help patients start and adhere to statin therapy (Table 4).

Patient education and support. FPs and patients both emphasized that a clear understanding of the importance of cholesterol reduction with statins was critical to use and adherence. This may be facilitated through patient-directed education regarding the benefits of statins. Most FPs invested time to discuss statin indications and cardiovascular risk factors with patients during their medical visits. Beyond their FP, other sources of education were noted to be helpful by patients including family members, friends, nurse practitioners, specialist physicians, and "trusted" online sources (eg, Diabetes Canada and Mayo Clinic websites).

Shared decision making. FPs recognized that using shared decision-making approaches was helpful in getting patients to agree to therapy; this was also reflected in patients' comments expressing their desires to be considered partners in their care. FPs characterized several aspects of shared decision making that were thought to be helpful: listening to patient concerns and addressing them, managing patient expectations with realistic views of side effects, and making efforts to build rapport. One FP stated, "another big part of any of our jobs is just listening to the concerns they have and then addressing those" (Female, FP #1). For instance, in dealing with patients' preference for nonpharmacologic approaches, failed attempts to manage their lipids without drug therapy were also described as being a facilitator for statin use. One FP stated:

> Even though we know [that] significant reduction in LDL, through diet or lifestyle alone, does not typically get as much… as our medications. We always will try that first because it's the patient processing that, they can actually see he hasn't just gone to a drug, they've given him an opportunity, they are talking about non-drug interventions, he can see that they're [lab results] not meaningfully changing, so maybe it is a good idea to start looking at the medication and the benefits. (Male, FP #7)

Our findings also indicate that another facilitator was FPs' receptiveness to reassessing patients' need for statin, especially for those who refused to start statins on diagnosis or became reluctant to continue therapy. By "giving them [patients] time…let them come to you with their concerns" (Female, FP #3), this "second opportunity" might allow patients to reconsider their original decision.

It was also suggested that using shared decision-making tools such as risk calculators was a helpful way to demonstrate reduction in cardiovascular risk. FPs welcomed collaborations with other health care professionals (eg, specialists, pharmacists, nurses, and dieticians) to use a different angle to engage patients in discussions about statin therapy and cardiovascular risk. Altogether, shared decision making aims to build strong therapeutic relationships between patients and their health care providers to facilitate open and frank discussions about the risks and benefits of statin therapy.

Clinical decision support tools. Several FPs suggested that they had used clinical decision support tools to guide patient selection and treatment type (ie, statin dose). Among these tools, the Framingham Risk Score was the most referenced tool used to calculate and stratify patient risk of CVD. FPs also endorsed the need for electronic decision support tools that are built into their existing electronic medical record systems, which would flag patients with statin-indicated conditions who are not yet taking statins. Clinical practice guidelines were also cited as being useful to FPs, with the caveat mentioned above that there are points of disagreement between major guidelines on this topic. Some providers mentioned that practice audits conducted by external groups helped them to identify patients at risk and who required follow-up of unaddressed medical issues (ie, indicated cancer screening); however, the benefits of this resource have yet to be realized for statins specifically.

Strategies to overcome patient resistance. In addition to the facilitators described above, which largely help with countering resistance to statin initiation, both patients and FPs identified that it was crucial to employ specific strategies to encourage patients continue statin therapy. These strategies were grouped into 2 broad categories: prescription- and non—prescription-based strategies. One specific prescription-based strategy was being satisfied with patients' ability to stay on a tolerable dose, rather than adopting a rigid treating-to-target approach that may require aggressive dose escalation. Furthermore, in the face of statin side effects, both FPs and patient participants found that changing the type of statin medication and lowering the dose were effective strategies to help patients feel they were being listened to but also encouraged them to remain on therapy. One FP reported the use of nonstatin lipid-lowering agents when patients could not tolerate any statin. To overcome the challenges associated with pill burden, some FPs described undertaking a review of the patient's medication list, attempting to deprescribe other medications when possible; this was specifically raised in the context of elderly patients. The possibility of using alternative dispensation (such blister packing) was raised as an option to simplify the task of taking many medications pills from different bottles. To save on dispensing fees, one patient had requested a prescription for a higher dose (which cost the same amount as a lower dose) and then split the tablets to obtain a supply for 6 months from a 3-month prescription. Some providers also suggested that combination pills of commonly coprescribed medications would help with statin uptake: "so any time that we can combine… just like there's like Metformin and Januvia, if there was a Metformin and a statin that would be great 'cause almost anybody that's on Metformin needs a statin" (Male, FP #16).

In terms of nonprescription strategies, several FPs described the benefits of follow-up testing to monitor patients' adherence to statin therapy. Even though FPs were aware of some primary care guidelines that recommend against follow-up testing, physicians reported that they will plan ahead for scheduled lipid testing (after statin therapy has begun) to demonstrate to their patients the outcome of improved lipids on therapy—especially for those who "need to see the carrot of seeing their numbers decrease" (Female, FP #9).

Discussion

Despite high-quality randomized controlled trials, endorsement by major national and international guidelines, and over 30 years of clinical experience with statins, a significant treatment gap remains in individuals at high risk for CVD.[10,16,18,37] Using qualitative methods, we identified

several important perspectives on barriers to and facilitators of statin use from the perspectives of patients and FPs.

Although there are a few studies that have assessed patient-level barriers of statin use, we could not find any studies that explored patients' perspectives with qualitative detail and unprompted, particularly on facilitators of use.[25,26] Furthermore, less is known about FPs' experiences, their common reasons for not prescribing statins, or the facilitators and challenges they encounter when they do prescribe statins. Previous studies have conducted surveys with patients on barriers to statin use such as in a study by Fung et al.,[26] who conducted telephone surveys on predefined potential barriers. Patients identified that the most common barriers to taking statins were preferring lifestyle changes, disliking medications, and fear of liver and kidney problems.[26] Similarly, barriers reported by patients surveyed from the **P**atient and Provider **A**ssessment of **L**ipid **M**anagement (PALM) registry were that statins were not necessary, fear of side effects, and/or perception of side effects.[25] We identified additional barriers in our study but also importantly described a number of facilitators of use that were endorsed by patients and FPs. Patients welcomed education and support through their FP with an emphasis on the importance and benefits of statins. Despite patients being concerned about potential side effects and the costs associated with statin use, they also welcomed strategies to address potential side effects (ie, lowered dose or changing statin) and costs (ie, splitting of higher dosage tablets to improve cost-effectiveness). Patients also endorsed consulting with other trusted information sources (ie, other health professionals, online sources) as a facilitator to statin use that was also supported by FPs. Thus, efforts to improve statin use should include robust resources for physicians to aid in their counselling that is inclusive of addressing patients' concerns (ie, side effects, costs) upfront with strategies to address them as well as encouraging the use of trusted information sources.

FPs reported that discordance in specialist and primary care practice and guidelines was a challenge. Notably in Canada, several major professional associations have developed guidelines for the management of dyslipidemia, including the Canadian Cardiovascular Society, Diabetes Canada, and the Alberta College of Family Physicians.[10,11,38] Although there are many similarities, some differences exist with respect to specific treatment indications, monitoring, and follow-up. To address the issue of having multiple cardiovascular guidelines for primary care in Canada, the **C**anadian **C**ardiovascular **Ha**rmonized **N**ational **G**uideline **E**ndeavour (C-CHANGE) guideline for cardiovascular care in primary care was published using a rigorous guideline methodology with the inclusion of 8 professional organizations.[39] Efforts are ongoing for disseminating these guidelines through national primary care and specialist certifying bodies.[39]

FPs described several similar facilitators to therapy as patients, also endorsing shared decision making and clinical decision support as enablers for improvement. FPs described the need for electronic decision support tools that are built into their existing electronic medical record systems, which would flag patients with statin-indicated conditions who are not yet taking statin therapy. One possible strategy is "facilitated relay" in which clinical information is directly collected from patients and delivered to care providers by means other than the existing medical record.[40] Thus far, preliminary studies of facilitated relay to increase statin prescriptions show promise.[41-43] In one study, the provision of risk scores and treatment recommendations to ordering FPs resulted in a 26% relative and a 6.4% absolute increase in prescriptions for statins in high-risk patients.[42] Tools for shared decision making could also be more routinely incorporated into clinical practice like the "Statin Choice Electronic Decision Aid."[44] This shared decision-making web-based tool allows physicians to choose from several risk calculators during the clinical encounter and supports shared decision making with patients through visual aids describing risks and benefits of statin use.

Our study has important implications for uptake of statin therapy in individuals at high risk of CVD. Our study supports the need for the development of tools and strategies to fill the existing gap between ideal and current statin use in high-risk populations. Although an approach tailored to meet the needs of individual patients may be ideal, strategies that could address several barriers and build on facilitators identified by both patients and FPs may prove to be more effective than those addressing barriers in only 1 stakeholder group. As we await larger scale, population-based studies of decision aids and facilitated relay for statins, several provinces in Canada already use laboratory-based, facilitated relay for surveillance and screening for cervical, breast, and colorectal cancer.[45]

There are several strengths of this study. Our study assessed barriers to and facilitators of statin use concurrently in 2 major stakeholder groups, which allows for the development of more comprehensive strategies to improve statin use, rather than one that relies on 1 stakeholder group alone. We included a diverse group of patients and FPs using detailed qualitative methods. Patients varied in age, gender, and statin-indicated conditions. Over 50% of FPs had more than 100 patients with stain-indicated conditions highlighting that they had extensive clinical experience and were from varied practice settings (ie, urban, rural, indigenous communities, varied socioeconomic catchments, community and academic settings, etc.). Importantly, we identified many barriers to and facilitators of statin use, and given this, the results of our study can be leveraged to guide the design of interventions that increases the likelihood of acceptability by both of these major stakeholders. There are also some limitations to this study. First, as with most qualitative studies, the number of participants was small, and certainly smaller when compared with sample sizes in quantitative studies. Sample sizes in qualitative studies tend to be small to support in-depth analyses and this type of inquiry.[46] In qualitative research, adequate sample size is generally deemed to have been achieved when a deeper understanding of experience occurs.[47] Because of the use of convenience sampling for the patients in this study, we might not have included participants with all points of view, and it is possible that more themes may have emerged if a larger group were sampled particularly as 75% of our patient participants had statin-indicated conditions with conditions other than pre-existing CVD. Given that less than half of our sample reported having medication insurance coverage, which is lower than the national average, it is possible that the financial-related barriers described may not be fully representative of experiences in the general population.[48] However, financial barriers were only one among many different barriers

reported in our findings. Our FPs were sampled purposively and to saturation, overcoming some of these challenges; however, because the sampling started with stakeholders who had prior knowledge about the study, it is possible that our sample had more exposure to physicians who had more experience treating patients with statin-indicated conditions. Furthermore, many FPs who participated in our study were women younger than 40 years of age, it is possible that more variation in FP participants may have uncovered other perspectives not represented here. However, we did sample purposively, so even though there were more younger women, we had respondents representing a variety of age and gender combinations.

Conclusions

In summary, we identified several important barriers to and facilitators of statin use at the patient and prescriber level. This information offers insight into strategies to improve statin use and the development of innovative programs and interventions to improve statin use to ultimately reduce CVD and its significant impact on Canadians. Programs and strategies that address several barriers and/or facilitators identified by these key stakeholder groups may have more potential for impact than programs that address just 1 barrier. Using the information from our study, such programs or strategies could be designed to be sustainable, minimally resource intensive, and patient centred.

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Disclosures

C.N. is a director of a private laboratory that does not currently offer testing in the jurisdiction under study. The rest of the authors have no conflicts of interest to disclose.

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at https://www.cjcopen.ca/ and at https://doi.org/10.1016/j.cjco.2020.07.002.