

Exploring the Barriers to and Facilitators of Using Evidence-Based Drugs in the Secondary Prevention of Cardiovascular Diseases

Findings From a Multistakeholder, Qualitative Analysis

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ABSTRACT

Background: Health-system barriers and facilitators associated with cardiovascular medication adherence have seldom been studied, particularly in low- and middle-income countries where uptake rates are poorest.

Objectives: This study sought to explore the major obstacles and facilitators to the use of evidence-supported medications for secondary prevention of cardiovascular disease using qualitative analysis in 2 diverse countries across multiple levels of their health care systems.

Methods: A qualitative descriptive study approach was implemented in Hamilton, Ontario, Canada, and Delhi, India. A purposeful sample (n = 69) of 23 patients, 10 physicians, 2 nurse practitioners, 5 Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy physicians, 11 pharmacists, 3 nurses, 4 hospital administrators, 1 social worker, 3 nongovernmental organization workers, 2 pharmaceutical company representatives, and 5 policy makers participated in interviews in Hamilton, Ontario, Canada (n = 21), and Delhi, India (n = 48). All interviews were digitally recorded and transcribed followed by directed content analysis to summarize and categorize the interviews.

Results: Themes that emerged across the stakeholder groups included: medication counseling; monitoring adherence; medication availability; medication affordability and drug coverage; time restrictions; and task shifting. The depth of verbal medication counseling provided varied substantially between countries, with prescribers in India unable to convey relevant information about drug treatments due to time constraint and high patient load. Canadian patients reported drug affordability as a common issue and very few patients were familiar with government subsidized drug programs. In India, patients purchased medications out-of-pocket from private, community pharmacies to avoid long commutes, lost wages, and unavailability of medications from hospitals formularies. Task shifting medication-refilling and titration to nonphysician health workers was accepted and supported by physicians in Canada but not in India, where many of the physicians considered a high level of clinical expertise a precondition to carry out these tasks skillfully.

Conclusions: Our findings reveal context-specific, health system factors that affect the patient's choice or ability to initiate and/or continue cardiovascular medication. Strategies to optimize cardiovascular drug use should be targeted and relevant to the health care system.

Aspirin, statins, angiotensin-converting enzyme inhibitors, and beta-blockers are cardiovascular medications that have been shown to reduce the risk of death, myocardial infarction, and stroke in patients with cardiovascular disease (CVD) [1–4]. The PURE (Prospective Urban Rural Epidemiology) study demonstrated that the use of these medications for CVD secondary prevention is low worldwide, with rates of use of 40.0% to 66.5% in

high-income countries, 11.8% to 30.0% in upper-middle-income countries, 4.3% to 21.9% in lower-middle-income countries, and 3.3% to 9.7% in low-income countries [5].

The reasons for the suboptimal use of evidence-supported medications are likely to be multifactorial and context-specific. The patient-level factors shown to be associated with low adherence include pill load [6], health literacy [7], age [8], ethnicity, education level, cognitive

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TABLE 1. Barriers and facilitators in Canada and India

Barrier		Facilitator	
Canada	India	Canada	India
Mode of counseling	Mode of counseling	Monitoring adherence	Monitoring adherence
Time constraints	Time constraints	Family support	Family support
Medication cost	Medication cost	Addressing poor adherence	Inquiring about medication affordability
High patient loads	High patient loads	Inquiring about medication affordability	
	Uncomprehensive medication counseling	Adherence follow-up by NPHW	
	Resistance to task shifting	Supportive of task shifting	
	Access to government subsidized medications		

NPHW, nonphysician health care worker(s).

function, and employment status [9,10]. Additionally, the number of medications, side effects, and the relationship with health care professionals (HCP) are treatment-related and patient-provider-related factors that may influence medication use [11]. Appropriate medication use is affected by all levels of the health system including the HCP; the organization of hospitals, pharmacies, and clinics; and the health policies and economic conditions under which the patients live and the HCP work. A limited number of studies have examined health system barriers and facilitators associated with cardiovascular medication adherence, particularly in low- and middle-income countries where rates of use are poorest [12]. Of the studies conducted, the use of combination pills [13]; subsidized medication costs through copayments [14,15]; and physician, nurse, or pharmacist counseling improved adherence in secondary prevention patients [16–18]. Given the absence of data in low-income countries, and the multifactorial causes of decreased adherence, additional research is needed. Quantitative methodologies may be inadequate to capture the complexities and relationships among stakeholders of a health care system. Therefore, we explored the major obstacles and facilitators to the use of evidence-supported medications for secondary prevention of CVD using qualitative analysis in 2 diverse countries across multiple levels of their health care systems. These together may help strategize future major researches and policy.

METHODS

We conducted a qualitative descriptive study to explore the barriers and facilitators to CVD medication adherence in 2 settings—Hamilton, Ontario, Canada, and Delhi, India. We selected these 2 settings because they reflect a balance between contrasting economic status and health system structures and the feasibility of successfully carrying out the study. The units of analyses were the stakeholder groups involved in the study, which include patients;

physicians: family physicians; cardiologists; nurse practitioners; Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy (AYUSH) physicians; and nonphysician health care workers (NPHW): pharmacists, pharmaceutical companies, social workers, nongovernmental organization workers, nurses, hospital administrators, policy makers. In Canada, nurse practitioners complete additional educational training and have authority to prescribe medications. Given their advanced knowledge and responsibilities, we present the findings for physicians and nurse practitioners as one stakeholder group.

The sampling methodologies used were specific to each context and stakeholder group (Table 1). In Canada, patients were sampled through purposeful sampling. The patients were identified from the research investigators' patient lists and patient referrals from other HCP and were invited to participate in the study. Purposeful and snowball sampling were used to recruit physicians, pharmacists, social workers, and policy makers. We identified these stakeholders through colleague referrals and invited potential respondents to participate by telephone and e-mail. Additionally, we used the snowball sampling technique; this technique involved asking the participants to refer other stakeholders with knowledge and experience that may be relevant to the study.

In India, purposeful sampling was used to sample cardiologists, AYUSH physicians, and pharmacists. Hospitals in New Delhi and the National Capital Region with Cardiology and AYUSH departments were identified and contacted via e-mail and telephone to recruit participants. Similarly, pharmacists within the region were contacted personally. Snowball sampling was used to recruit patients, nurses, and hospital administrators. The participating cardiologists were asked to refer secondary prevention patients, administrators working within the hospital, and nurses on their service. Lastly, the policy makers working in the Department of Non-Communicable Disease within the Ministry of Health

and Family Welfare, Government of India were contacted via e-mail and telephone.

In both contexts, in-depth, semistructured interviews were conducted to explore the perceptions of cardiovascular medication use in secondary prevention, and the health system factors that influenced medication uptake. The interviews were undertaken by research assistants at a private location selected by the participants in New Delhi, and at the David Braley Research Institute, Hamilton General Hospital, Hamilton, Ontario, or by telephone. A total of 61 interviews were conducted in person and 8 were conducted via telephone. The interviews lasted between 30 and 60 min and consent was obtained for the interviews to be audio recorded. A final sample ($n = 69$) of 23 patients, 10 physicians, 5 AYUSH physicians, 11 pharmacists, 2 nurse practitioners, 3 nurses, 4 hospital administrators, 1 social worker, 3 nongovernmental organization workers, 2 pharmaceutical company representatives, and 5 policy makers participated in the study. [Table 2](#) illustrates characteristics of the stakeholder groups.

Data collection and analysis were completed concurrently from December 2014 to November 2015. The interviews were transcribed verbatim with directed content analysis [19] guiding initial coding and analysis to organize, summarize, and categorize the data. Data analysis was completed by V.M. in Canada, and L.N. and M.S. in India by deriving codes, organizing the codes into broader categories, and collapsing the categories into themes and subthemes. L.N., M.S., and V.M. compared the emergent themes between the 2 countries to identify similarities and differences. Detailed theme summaries were written for each of the stakeholder groups in both countries.

We used Guba and Lincoln's criteria [20] (credibility, transferability, confirmability, and dependability) to ensure trustworthiness in the qualitative findings. [Table 3](#) shows the strategies used. Research ethics approvals were obtained from the Hamilton Integrated Research Ethics Board and Institutional Ethics Committee, Public Health Foundation of India. Participants provided written consent for in-person interviews and verbal consent for telephone interviews.

RESULTS

We present our findings under 6 main themes identified from analysis of the stakeholder groups' responses. These themes encapsulate responses across the stakeholder groups and demonstrate the agreement or contrast among the groups. Additionally, the themes described within each stakeholder group are presented in the [Online Appendix \(Online Tables 1 to 10\)](#).

Medication counseling

In Canada, physicians, nurses, and pharmacists provided medication counseling to patients, whereas in India, counseling was exclusively provided by physicians. The information provided during counseling included the

purpose of the medication, dosage, frequency, contraindications, side effects, adverse effects, instructions on how to take the medication, and medication benefits. The physicians, nurse practitioners, and pharmacists in Canada reported providing thorough medication counseling. In India, the physicians did not extensively discuss the purpose, benefits, or side effects of medications with patients due to time constraints. Additionally, they felt that notifying patients about potential side effect may decrease adherence. The primary mode used to communicate information about medications was exclusively verbal, except the Canadian pharmacist group who provided patients with written drug fact sheets for each prescription.

The patients in India stated that they felt they lacked adequate information about medication side effects and they often attributed a multitude of physical discomforts to side effects of their medications.

The physicians and nurse practitioners in Canada and AYUSH practitioners in India included patients in the decision making when developing their treatment plan. Conversely, the physicians in India indicated that joint decision making does not regularly occur due to low patient education level and lack of desire to be included in treatment planning: "[Ninety percent] of [patients] are not involved and don't want to get involved. They only want a remedy. They think doctor knows the best; that is the kind of wisdom they have which is not right but that is how they are brought up in their villages that if you have this problem go to the doctor he will give you the medicine and no questions. That is the kind of patients we deal with" (physician 4, female, 31 years of work experience, 730 patients per month, India).

Monitoring adherence

In Canada and India, the physicians (allopathic and AYUSH) and nurses monitored patient medication adherence by asking the patient, checking biological markers (blood pressure, blood lipid levels), and examining the patient's prescription history. The HCP who reported discussing adherence with the patient included physicians, nurse practitioners, nurses, and pharmacists. Additionally, the patients in Canada stated that their physicians regularly inquired about their medication adherence, whereas in India this was seldom reported.

The physicians in Canada addressed poor adherence by providing the patient with additional information on the purpose and benefits of the medication, discussing the health implications of nonadherence, making recommendations to assist the patient with establishing a medication routine, involving family members to reinforce the importance of being adherent, and trying to understand the factors affecting adherence.

Medication availability

In India, several patients stated that the nearest health care facility (public or private) and pharmacy were at

TABLE 2. Contrasting key themes between the stakeholders in Canada and India

Theme	Canada	India
Medication counseling	Communicated verbally Written materials provided to patients by pharmacists Information communicated: medication purpose; benefits; dosage; frequency; side effects; adverse effects; contraindications; instructions on how to take Joint decision making practiced by most physicians/nurse practitioners	Communicated verbally Written materials not provided to patients by HCP Information communicated: medication dosage; significant side effects Joint decision making practiced by AYUSH physicians
Medication adherence	Medication adherence assessed by physicians/nurse practitioners, pharmacists Methods used to check adherence: biological markers; prescription refill history; ask patient about medication use Methods to address nonadherence: additional counseling and education (purpose, benefits, health implications); involve family members; recommendation to establish a routine Patients reported being asked about adherence by their HCP	Medication adherence assessed by physicians, nurses Methods used to check adherence: biological markers; ask patient about medication use The doctors mentioned that due to time constraints, they were unable to ask about adherence during every single visit
Affordability and drug coverage	Medication coverage discussed with patient: physician/nurse practitioner; pharmacist; social worker HCP were knowledgeable about resources available to patients with affordability issues (government programs, social worker consult) Tailors prescription to patient socioeconomic status: generic medication; modified dose and frequency; limit number of medications; combination pill Medication dispensing fee: \$10.50–\$12.00 per medication Medication costs not advertised or standardized across pharmacies Medication coverage through employer, private insurance, government (ODBP) One-third of patients reported medications were unaffordable	Tailors prescription to patient socioeconomic status: generic medication Medication costs not advertised or standardized across pharmacies Medication coverage through government (universal health coverage)
Time restrictions	Number of patients seen per day: 7–55 Appointment length: 5–30 min Long wait times to see specialists Patients dissatisfied with appointment lengths Constrained by time: physicians/nurse practitioners	Number of patients seen per day: 75–185 Suboptimal physician-patient ratio Constrained by time: physician, AYUSH practitioners
Task shifting	Follow-up by NPHW reinforces counseling Patients receive counseling from physicians/nurse practitioners, nurses, pharmacists, social workers NPHW renewing and modifying medications was supported by physicians/nurse practitioners, pharmacists Access to patient medical history, lab/test results, clinical experience needed to manage medications	Patients receive counseling from physicians, medical residents/students, nurses NPHW prescribing, renewing, and modifying medications were only supported by physicians. Nurses are not capacitated to do the same Extensive clinical experience needed to manage medications

AYUSH, Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy; HCP, health care professional(s); NPHW, nonphysician health care worker(s); ODBP, Ontario Drug Benefit Plan.

considerable distance from their residence, particularly those residing in rural areas. Many patients expressed distrust of private facilities and felt that better treatment was provided at government-funded hospitals, which required traveling further to receive treatment. The longer commute to access care and fill prescriptions resulted in considerable expenditure from lost wages and travel expenses, and older patients relied heavily on family members to procure their medications. The patients who were

entitled to government-subsidized medications indicated that they were required to commute to specific dispensaries and their medications were frequently unavailable.

Medication affordability and drug coverage

In Canada, physicians and pharmacists reported asking patients about medication affordability and coverage. Medication cost was the largest barrier to adherence

reported by physicians, health care administrators, and policy makers in India. However, the physicians in India stated that they did not overtly ask patients about medication affordability unless the patient explicitly stated that they were unable to afford their medications. Conversely, the physicians in Canada indicated that the minority of their patients experienced difficulties affording cardiovascular medications.

Most patients in India stated that they received medication coverage through the central or state government scheme and they accessed the subsidized medications from government-funded hospitals monthly. Many patients chose to pay out of pocket to purchase medications from private sector pharmacies to ensure consistent access to medications. "We are poor people. If we really were to buy medicines from outside, we would die. Thankfully we get free medicines from the government. We get free medicines from the hospital itself. We come here once in a month. Get all the medicines from the hospital itself" (patient 8, 62 years old, male, India).

Within Canada, patients reported having medication coverage through employer health benefits programs, private insurance, or government programs. The cost of medications was a barrier for 3 of the 9 Canadian patients. These patients reported spending \$40.00 to \$300.00 per month on medications, including dispensing fees. "The biggest problem that I told [my cardiologist] is that I lost all my health coverage this February. I told him that what I am going to do to, to save money is skip my pill one day and take them every other day" (patient 1, 59 years old, male, Canada).

Within Canada, the physicians and pharmacists were aware and referred patients to several government programs to subsidize medication cost for patients with financial difficulties. The Canadian social worker reported regularly seeing patients with difficulties affording cardiovascular medications, and she recommended that patients apply to the Ontario Trillium Benefit Plan, Ontario Works, and the Ontario Disability Support Program for assistance. She indicated that many patients are not aware of programs offered by the government to improve affordability and approval for these programs could take several months.

Additional strategies that were used by these stakeholder groups to improve medication affordability included modifying the dose and frequency and limiting the number of medications. Furthermore, prescribing generic medications was a common practice used by the Canadian physicians. However, the physicians in India indicated that they based their prescribing practices on the information obtained from medical representatives, which resulted in a greater preference for prescribing branded medications. The use of polypills to reduce pill burden and improve medication affordability was not widely supported by the physicians in India because they felt that polypills could not be tailored to the specific patient.

Within India, the pharmacists stated that many patients attempt to negotiate the cost of medications with the

TABLE 3. Strategies for study rigor

Criterion	Strategies
Credibility	Included multiple subcases Established trusting investigator-participant relationships Maintained master code book Used several research team members to code the data and have regular discussions about analysis decisions Debriefed Sought substantiation of findings with participants
Dependability	Adhered to the research protocol Documented choices made about methodologies used Maintained organized paper and electronic databases Composed detailed summary reports for each stakeholder group
Conformability	Sampled participants from a variety of stakeholder groups Transcribed the interviews verbatim
Transferability	Reported in-depth descriptions of findings

pharmacist, but high taxes, drug licenses, and permits prevented pharmacies from being able to offer medication discounts and rebates to patients. The pharmacists reported adhering to the prescriptions written by physicians even if generic medications were available as a more cost-effective option.

Time restrictions

In both contexts, physicians (allopathic and AYUSH), nurses and health care administrators indicated that high patient workloads and time constraints affected the physician's ability to spend an adequate amount of time counseling patients on their medication usage and adherence. The number of patients seen per day ranged from 75 to 185 for physicians in India and 7 to 55 for physicians in Canada. Furthermore, the health care administrators in India stated that 160 to 1,000 patients were seen per day in the cardiology department.

The Canadian patients were dissatisfied with the wait times to schedule appointments and short appointments durations. Many indicated that they were not able to spend an adequate amount of time with their physician to discuss their medical concerns.

Task shifting

In Canada, the physicians discussed the importance of patients' receiving follow-up by NPHW as a means of reinforcing counseling on medication use. In addition to physicians and nurse practitioners, patients regularly interacted with residents/medical students, nurses, and hospital/community pharmacists.

The physicians and pharmacists in Canada were also supportive of NPHW taking on new roles and responsibilities in relation to renewing and modifying prescriptions, provided they completed training and certification. Furthermore, the pharmacists felt comfortable prescribing medications for patients with stable

cardiovascular conditions. “Many times a treatment is very algorithmic and a lot of cardiovascular medications do not have many risks so, I think someone can be easily trained in managing the first step such as blood pressure control or optimizing cardiovascular medication without too much risk; if they are presented with an algorithm or strategy to do so in a setting where a physician can be alerted. I think it has to be in a controlled environment then it’s a reasonable thing to do” (physician 4, male, 5 to 10 patients per day, Canada).

In contrast, in India, physicians were not supportive of NPHW prescribing, modifying, and renewing medications, and they indicated a lack of clinical experience and expertise as the deterrent. However, the nurses indicated that short-term certification would be sufficient to provide them with the necessary knowledge to prescribe medications.

DISCUSSION

This qualitative study yielded several important findings. First, we found that the barriers to medication adherence did not differ substantially between the 2 contexts. The barriers that were present in both Canada and India included high patient loads, time constraints, medication affordability, and the absence of written counseling. Instead, limited medication counseling, adequate availability, and accessibility to health care services and resistance to task shifting were barriers that were exclusive to India.

Second, both contexts reported that monitoring adherence promoted better medication compliance. However, additional facilitators unique to Canada included adherence monitoring by NPHW, inquiry and referral to programs to improve medication affordability, and task shifting medication renewal to NPHW. Medication affordability was consistently recognized as a strong barrier to adherence across the stakeholder groups despite drug coverage availability in both countries. This finding is in line with previous research that has shown that lower out-of-pocket medication expenses are associated with greater levels of adherence [21,22] and adherence can be modestly improved when patients are provided with full medication coverage [23]. Within Canada, many adults do not have medication coverage and must pay out of pocket to cover some portion of their medication expenses [24,25]. Despite the availability of government drug programs, very few Canadian patients reported being familiar with these programs, which suggests that public health agencies and HCP should work to increase patient awareness and facilitate higher utilization rates. In India, the affordability of medications is heavily dependent on access to hospital formularies. Many patients chose to purchase medications out of pocket from private, community pharmacies to avoid long commutes, lost wages, and the unavailability of medications from hospitals’ formularies. Although the patients included in the study did not report medication unaffordability, this finding may be reflective of social stigma related to disclosing financial information. Policies

that extend the government-funded drug coverage to community-based pharmacies may address unaffordability and access to medications in India.

We also demonstrated that the depth of counseling varied between Canada and India. In India, physicians regularly failed to discuss critical information with a patient when prescribing a medication. Medication indication [9] and possible adverse effects [26] may influence the patient’s adherence, both of which were not regularly discussed. A greater emphasis on counseling patients in India on the efficacy and effectiveness of generic medications may reduce self-alteration of medication and improve the use of affordable generic drugs. In Canada and India, verbal information was the primary mode of counseling provided by HCP and written materials were not routinely used. The duration of time spent counseling patients and a trusting physician-patient relationship has been shown to be positively associated with adherence [27–29]. However, the HCP in Canada and India indicated that time constraints inhibited their abilities to provide thorough medication counseling to patients.

Third, in Canada, physicians were supportive of the redistribution of medication renewal and modification to NPHW. Conversely, physicians in India stated that NPHW lack the clinical expertise to manage cardiovascular medications. Several studies have demonstrated improved adherence [30], health outcomes [31], treatment concordance between physicians and NPHW, and the cost-effectiveness of task shifting for chronic disease management [32,33]. Furthermore, Adeyemo et al. [34] showed that nurse-led follow-up, counseling, and medication prescription resulted in high rates of adherence in Nigerian hypertensive patients, suggesting that it is a suitable intervention in middle- and low-income countries.

Strengths and limitations

Our study has some limitations. First, the sample sizes for some of the stakeholder groups were small and may not reflect the perspectives of these groups, and the stakeholders included do not represent an exhaustive list of groups relevant to the health system. A limited number of individuals occupy these health care roles, which reduced the potential pool of participants for these groups. Extensive efforts were made to recruit participants from each of the stakeholder groups and colleague referral was predominantly used in Canada to improve the feasibility of recruitment. Second, the study sampled participants from 2 cities in Canada and India, and the findings may not be transferable to other settings or contexts. However, in-depth descriptions of the sampling and data collection methods enable readers to determine whether the findings are transferable to other contexts. Lastly, social desirability bias may influence participants to present their experiences positively. Participant confidentiality and anonymity were emphasized prior to beginning the interviews. Furthermore, the HCP

responsible for referring participants were not involved in the data collection and analysis, and patients were informed that their quality of care would not be influenced by study participation.

Qualitative research provides the opportunity to solicit rich information about the health system barriers to and facilitators of CVD medication adherence from patients and the key HCP involved in patient care. Within this study, the selection of stakeholder groups was specific to the 2 contexts. For example, social workers are commonly employed by Canadian hospitals to refer financial and social resources to patients and their family members. Conversely, we did not include social workers in India because they were not referenced during interviews with the patients and HCP. Furthermore, the country of conduct influenced the type of sampling methodologies used. In accordance with ethical standards in Canada, the recruitment of patients through physician's referral required the physicians to obtain patient consent prior to contact from study staff. This requirement was not stipulated by ethical review boards in India. Therefore, future qualitative research on health system barriers in other countries should consider the context, particularly when selecting key stakeholder groups and implementing sampling strategies.

To our knowledge, this is the first study to examine the health system-related barriers and facilitators of medication use in secondary prevention of CVD from the perspectives of key HCP and patients. The strength of this study is that it highlights the context-specific health system factors that influence adherence to cardiovascular medication and demonstrates the differences and similarities between the 2 countries. Another important strength of this study is that it provides information on obstacles and facilitators to medication use in India, a low-income country for which there is limited available published reports to inform policy development on medication adherence.

CONCLUSIONS

This study has identified several areas that should be addressed to improve medication adherence in secondary prevention of CVD. The barriers that we described herein included high patient loads, time constraints, medication availability and affordability, and the absence of written counseling. Additionally, monitoring adherence, adherence follow-up by NPHW, inquiry and referral to programs to improve medication affordability, and task shifting were the facilitators referred by the stakeholder groups. Our findings provide vital information to HCP, administrators, and policy makers about the factors that influence medication adherence in both contexts.

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APPENDIX

ONLINE TABLE 1. Key physician themes and examples of the evidence

Theme	Canada* (n = 6)		India† (n = 6)	
	Description	Example of Evidence	Description	Example of Evidence
Prescription practices	<p>Medications prescribed: statins; beta-blockers; ARB; ACE-I; aspirin</p> <p>Methods to keep up-to-date on medications: conferences; rounds; journal articles; cardiology guidelines</p> <p>Cardiovascular guidelines: Canadian Cardiovascular Society; American Heart Association; European Society of Cardiology</p> <p>Brand of medication predominantly prescribed: generic (mandated by hospitals in Hamilton)</p> <p>Factors considered when prescribing: scientific evidence; health history; cost; personal experience</p> <p>Prescription: hand written (hospital practices in Canada)</p>	<p>"I prescribe for a year and based on some of evidence that [researchers have] presented stating that some patients stop taking their medications after 30 days. I prescribe longer, but I think it's important to have good follow-up for these patients regardless of the length of their prescriptions. I think patients would be more adherent if they were seeing physicians more regularly." (Interviewee 2, male, cardiovascular fellow, 6 years of work experience, 10–15 patients per day)</p>	<p>Medications prescribed: statins; beta-blockers; ARB; ACE-I; aspirin</p> <p>Methods to keep up-to-date on medications: conferences; workshops; journal articles; Internet</p> <p>Cardiovascular guidelines: American College of Cardiology; American Heart Association; European Society of Cardiology</p> <p>Brand of medication predominantly prescribed: generic</p> <p>Factors considered when prescribing: patient health history; cost; side effects; number of medications per day</p> <p>Prescription: hand written</p>	<p>"For established CVD unless there are contra indicators (indications), we give anti-platelets, usually/definitely one or maybe anti-cholesterol which are usually statins and mostly beta-blockers ACE inhibitors which are angiotensin and then other drugs depending on added conditions and of course if they have comorbidity and have conditions such as diabetes that needs to be individualized. These are I would say foundation drugs and other drugs, for [example,] anti-anginal drugs, nitrates and of course if you have comorbidities." (Interviewee 1, male, senior cardiologist, 11 years of work experience, 150 patients per week)</p>
Medication counseling	<p>Information communicated to patient: medication purpose; dosage; frequency; side effects; adverse effects</p> <p>Source of information provided to patient: verbal</p> <p>Joint-decision making: patient preference considered</p> <p>Individualized treatment: believed to be beneficial but not offered due to time constraints</p>	<p>"Definitely. The patient is responsible for their health so they should be involved. The patient is ultimately the one who makes the decision, but I put it in such a way the patient can't really say 'no.' I simply say 'would you like to have [the medication], or would you prefer progressing to the next stage of the disease?'" (Interviewee 4, male, family physician, 27 years of work experience, 55 patients per day)</p>	<p>Information communicated to patient: medication dosage; significant side effects</p> <p>Source of information provided to patient: verbal</p> <p>Joint decision making: patient preference not considered regularly due to low education levels and lack of patient desire to be included</p>	<p>"First time, you do explain to them, next time you don't have time to reinforce that. You tell them that they have to take this medicine for life and that you need to do these three things and also meet the dietician if possible. At that point we also explain them that they should have the medicine once a day or twice a day, but this is only in the beginning." (Interviewee 3; 6.5 years of experience; 1,480 patients per month)</p>
Medication affordability	<p>Asks patient about drug coverage and medication affordability</p> <p>Aware of government drug programs</p> <p>Refer patients without drug coverage to government drug programs</p> <p>Tailors prescription to patient's socioeconomic status: generic medication; modified dose and frequency; limit number of medications</p>	<p>"Not in Canada. It really is not as much of an issue in Canada. Most of the medicines I use are covered. Predominantly through national health insurance. I think that only a minority of my patients do have issues with paying for their medications." (Interviewee 1, male, cardiologist, 13 years of experience, 7–10 patients per day)</p>	<p>Medication cost is the biggest factor affecting adherence</p>	<p>"Cost is a huge factor especially because we are in a public hospital and we get patients who are not too well off so cost is a big factor." (Interviewee 2; 11 years of experience; 600 patients per month)</p>

(continued)

ONLINE TABLE 1. Continued

Theme	Canada* (n = 6)		India† (n = 6)	
	Description	Example of Evidence	Description	Example of Evidence
Adherence checking	<p>Asks patients about medication adherence regularly</p> <p>Routinely checks biological markers (blood pressure, blood lipids) to monitor adherence</p> <p>Addresses nonadherence through additional information on purpose and benefits of medication, health implications, recommendation to establish routine and involve family members</p>	<p>“You have to trust your patients, but if they tell me that they are, and their lab work clearly shows they are not—and the [electronic medical records] tells me that their prescription has expired—then those patients I make it a point to ask them when I see them. For example; if someone’s cholesterol is at 7.5 and I prescribe the medication and I check the lab results and now that patient’s cholesterol is down to 5.5 then I know that that patient is taking their medication. If the lab results come back the same or more than I know they are not taking [it].” (Interviewee 4, male, family physician, 27 years of work experience, 55 patients per day)</p>	<p>Asks patients about medication adherence regularly</p> <p>Routinely checks biological markers (blood pressure, blood lipids) to monitor adherence</p>	<p>“I ask many times in the sense that if I find that the blood pressure is not controlled despite adequate treatment or heart failure symptoms are increasing I look into the cause. For example angina is not under control so I look what is the reason, the first thing that comes to my mind is their compliance. I find that the patients are taking medicine but they are taking it in less dose and less number. And this is also a compliance issue.” (Interviewee 2, 11 years of experience, 600 patients per month).</p>
Time restrictions	<p>Patients seen per day: 7–55</p> <p>Appointment length: 5–30 min</p> <p>Physician group with highest patient load: family physician and cardiac fellow</p> <p>Constrained by time to provide adequate medication counseling</p>	<p>“It’s a very busy place with lots of people to see. If you don’t explain adequately what they are doing seeing you and why you are trying to help them then they will not understand the importance of the medication. So, more patients needing to be seen and less time to see them makes every patient on a bit of a time crunch.” (Interviewee 2, male, cardiovascular fellow, 6 years of work experience, 10-15 patients per day)</p>	<p>Patients seen per day: 5–25</p> <p>Constrained by time to provide adequate medication counseling</p>	<p>“Unfortunately due to constraints of time I don’t, but I do make it a point to ask when I find something is out of order. When I do give medicine and the effect is not there then you ask about compliance but on a day-to-day basis due to constraints of time we can’t. Gross compliance is done by 50%–60% of the people.” (Interviewee 3, 6.5 years of work experience, 100–120 patients per week)</p>

(continued)

ONLINE TABLE 1. Continued

Theme	Canada* (n = 6)		India† (n = 6)	
	Description	Example of Evidence	Description	Example of Evidence
Role of NPHW	<p>Follow-up by NPHW reinforces adherence</p> <p>Patients interact with nurses, hospital/community pharmacists, social worker</p> <p>Trained NPHW should be able to renew and modify prescriptions</p> <p>Nonphysicians should not prescribe medications: insufficient access to patient medical history and lab/test results; inadequate clinical training</p>	<p>“Prescribing medication should not just be specifically from a physician. It extends to the pharmacist and it is a two-way process and it extends to anyone who is involved in patient care, not just specialists, but allied health.” (Interviewee 1, male, cardiologist, 13 years of experience, 7–10 patients per day)</p>	<p>Patients interact with medical residents and students, nurses, pharmacists</p> <p>Nonphysicians should not prescribe, modify, or renew medications: lack of clinical training and expertise</p> <p>Supportive of patients practicing yoga</p> <p>Not supportive of ayurveda, unani, siddha, homeopathy</p>	<p>“I have seen that happening abroad and I am quite comfortable with that, the only thing is that they should be trained in a very systematic and structured manner before they can take up this responsibility because in India at least we are not training them in that manner. If we do it will be a great help to us in terms of time and we can devote more time on other things but unfortunately as of now it’s not happening. So, at this point of time I would be little apprehensive about it but I am sure if we train them in a particular manner and make sure they do the right thing it will be a great help to us.” (Interviewee 4, 31 years of experience, 650 patients per month)</p> <p>“I really can’t comment on that. As far as I now there is really not too much of science behind it. Ayurveda and homeopath in CVD have no effect. Yoga, definitely yes, in fact we are a part of a trial where we are analysing the effect of yoga on CVD. For yoga data [are] being generated and ayurveda arjuna that has antiangila effect.” (Interviewee 1, male, senior cardiologist, 11 years of work experience, 150 patients per week)</p>

ARB, angiotensin-receptor blocker; ACE-I, angiotensin-converting enzyme inhibitor; CVD, cardiovascular disease; NPHW, nonphysician health worker(s).

*Participant group included cardiologist, cardiac fellow, family physician, nurse practitioners.

†Participant group included cardiologists.

ONLINE TABLE 2. Key pharmacist themes and examples of the evidence

Theme	Canada (n = 3)		India (n = 8)	
	Description	Example of Evidence	Description	Example of Evidence
Staffing and training	<p>Pharmacist credentials: BS in pharmacology</p> <p>Pharmacy technician credentials: formal training</p> <p>Number of pharmacists employed: 2 to 16</p> <p>Number of pharmacy technicians: 3 to 24</p>	<p>“[The pharmacy technicians] have to have gone to an accredited college. They have to write a national licensing exam to be able to work here. They are qualified.” (Interviewee 2, male, community pharmacy)</p>	<p>Pharmacist credentials: majority not formally trained</p> <p>Number of pharmacy staff: 3 to 30</p>	<p>“[The pharmacy technicians] have prior experience of 3–5 yrs. Not formally trained, but they have good experience.” (Interviewee 7)</p>
Medication availability	<p>Pharmacy inventory: maintained electronically</p> <p>Organization of inventory: alphabetically or drug class</p> <p>Stock delivery: daily on weekdays</p> <p>Methods to obtain out-of-stock medication: order; borrow from another pharmacy; refer patient to another pharmacy</p>	<p>“It’s like a revolving door. We have drug deliveries daily Monday through Friday; it just depends on what we are low of and whether we can get a drug in by our distributor by the next day. We are often exchanging across hospitals. We also rotate our medication throughout the Hamilton Health Sciences site as well. We also borrow from community pharmacies. Inventory comes in mostly on a daily basis.” (Interviewee 1, female, hospital pharmacy)</p>	<p>Pharmacy inventory: maintained electronically</p> <p>Organization of inventory: not consistent across pharmacies and included alphabetically or drug class; name of medication or manufacturing company; by disease type</p> <p>Stock delivery: not consistent across pharmacies and varied from once every 2 months, monthly, and daily</p>	<p>“[Medication deliveries] happen every month. Monthly basis. The ones that are in demand in the market. The ones that the doctors prescribe.” (Interviewee 4)</p>
Medication affordability	<p>Asks patient about drug coverage and medication affordability</p> <p>Aware of government drug programs</p> <p>Refer patients without drug coverage to government drug programs</p> <p>Dispensing fee: \$10.50–\$12.00 per medication for community pharmacies; no dispensing fee for hospital pharmacies</p> <p>Methods to reduce cost of medication: modify dose and frequency; reduce the number of medications; combination pills</p> <p>Medication refill: 30 days</p>	<p>“I would mention Trillium if they have no insurance and let them know about the Trillium. For some people there is a deductible that some people need to pay before coverage starts—so, sometimes that does not work. Sometimes patients do not feel that Trillium is going to help them because they have to pay out of pocket for the deductible. Another thing we could do depending on what the medication is; we could contact the doctor and see if there is an alternate medication we could prescribe that the doctor might feel it is ok. There are different things we can try to try to encourage them to take their medication.” (Interviewee 3, female, community pharmacy)</p>	<p>Patients attempt to negotiate medication cost with pharmacist</p> <p>Medication discounts and rebates not regularly offered to patients</p> <p>High taxes, drug license, permits, and lack of government financial support to run pharmacies increase the cost of medications paid by the patient</p> <p>Substitute less expensive medication: minority of pharmacists</p> <p>Medication refill: 10 days to monthly</p>	<p>“No there are none [discounts]. There used to be a subsidy of 10% for CVD sometime back, not anymore. We don’t give even the 5% rebate. No I have set number of patients. Its direct business. We don’t reduce the cost of the medicine for anyone.” (Interviewee 5)</p>

(continued)

ONLINE TABLE 2. Continued

Theme	Canada (n = 3)		India (n = 8)	
	Description	Example of Evidence	Description	Example of Evidence
Medication counseling	<p>Medication counseling: all new prescriptions; additional counseling when requested</p> <p>Information provided to patient: medication purpose; benefits; side effects; dosage; frequency; instructions on how to take the medication; what to do if an adverse event occurs</p> <p>Mode of information: verbal and written drug fact sheets</p> <p>Monitor adherence: ask patient; review prescription refill history</p> <p>Methods to improve adherence: additional information; memory aids; tailor to patient lifestyle</p>	<p>"I usually ask first. I don't go and accuse of noncompliance because people get really defensive. I usually go the root of: are you still taking it? Or, have you gone elsewhere to get this? Or have you left town for a bit? That is how I start. If there is no logical reason why they are late, then I give them a talking to about compliance and the importance of compliance.</p> <p>Sometimes, it is just a misunderstanding- the doctor told them to cut the pills in half or they are taking them every other day—because they experienced side effects and that is what the doctor suggests—but, the patient does not tell us—so to us, it looks as if they are not taking it properly as prescribed. So what is supposed to be lasting them 90 days is lasting them 180 days. If nothing they say is adding up—then we should look at noncompliance in that case."</p> <p>(Interviewee 2, male, community pharmacy)</p>	<p>Regular exchange of information between the pharmacist and patient</p> <p>Information provided to patient: dosage; frequency; instructions on how to take the medication</p>	<p>"Yes there is exchange of information. We tell them about the dosage, frequency. We don't give information regarding side-effects, only in case when the patient asks."</p> <p>(Interviewee 6)</p>
Task shifting	<p>Pharmacists should be involved in prescription renewal and modifying the prescription</p> <p>Pharmacists should be involved in prescribing medications for patients with stable cardiovascular conditions</p>	<p>"Your medication expert is your pharmacist. Pharmacists are the best professionals to do it; but probably the most under-resourced and underutilized profession. It was discussed to moving some prescribing to pharmacists. Pharmacists have just been given authority to nicotine replacement therapy prescribing. That is the first step into the foray of risk factor modification; which I think is a great idea so as long as people start utilizing that source or even as a pharmacist group they start embracing it, to utilize it as well."</p> <p>(Interviewee 1, female, hospital pharmacy)</p>	<p>Pharmacy technicians dispense medications in the absence of the pharmacists</p>	<p>"If I am not around then my colleagues are also trained. None with less than 10 years of experience. They give the medicines"</p> <p>(Interviewee 6)</p>

(continued)

ONLINE TABLE 2. Continued

Theme	Canada (n = 3)		India (n = 8)	
	Description	Example of Evidence	Description	Example of Evidence
Memory aids and prompts	Telephone reminders for prescription refills: automated and manual	“We can generate [a list] through our software program and it will generate a list of people who are due to have their prescription filled within days. This is also a good way to see who is compliant and who is not. We will call people and let them know that their medication is due and that we will be getting it ready; most people are very grateful for that.” (Interviewee 3, female, community pharmacy)		

ONLINE TABLE 3. Key patient themes and examples of the evidence

Theme	Canada (n = 9)		India (n = 14)	
	Description	Example of Evidence	Description	Example of Evidence
Medical factors	<p>Cardiovascular condition: stroke; myocardial infarction; angioplasty; abdominal aorta calcification</p> <p>Medications: statin; beta-blocker; aspirin; ACE-I; combination of several medications</p> <p>Medication use: 2 months to 13 years</p> <p>Medication adherence: majority reported taking the medications as prescribed (n = 6)</p> <p>Medication side effect: fatigue; restlessness; difficulty sleeping; dry cough</p>	<p>“So, I started all three medications on April 1, 2015. I stopped the blood pressure May 21, 2015 and restarted the blood pressure medication on June 15, 2015 and I have been on it every day since.” (Interviewee 9, female, 63 years old)</p>	<p>Cardiovascular condition: coronary artery disease; myocardial infarction; angioplasty; percutaneous coronary intervention</p> <p>Medications: statin; beta-blocker; aspirin; ACE-I; combination of several medications</p> <p>Medication use: 6 months to 26 years</p> <p>Medication adherence: majority reported taking the medications as prescribed (n = 13)</p> <p>Medication side effect: uneasiness, edema, sore throat</p>	<p>“No, I don’t do that (stop having medicines without consulting the doctor). In fact I may take an additional pill...I don’t...I mean I want to live, I don’t want to hasten my...” (Interviewee 4, 74-year-old male, on medication for 26 years)</p>
Care provided by physicians	<p>Long appointment wait times to see cardiologist</p> <p>Dissatisfied with the length of appointments with physicians</p> <p>Individualized care not provided by physicians</p> <p>Patient’s preference not considered when developing the treatment plan</p> <p>Majority of patients were trustful of physicians</p> <p>Distrustful patients reported lower rates of medication adherence</p>	<p>“I am one of those people, that if you tell me I have to take it; then I will take it no matter at what rate. The way I see it is: the doctors are the ones who went to school, and I didn’t. So, I will listen to what they say. They know better than I. I have to listen, because I want to be around for my children and grandchildren.” (Interviewee 6, female, 88 years old)</p>	<p>Satisfied with treatment received from physicians</p> <p>Patient’s preference considered half the time when developing the treatment plan</p>	<p>“Whatever the doctor prescribes I take it without questioning him. He doesn’t consult me or anything, just writes down and then explains how to take the medicines.” (Interviewee 8, 62-year-old male)</p>
Medication counseling	<p>Medication information provided by family physicians, cardiologists, pharmacists</p> <p>Type of information provided: medication purpose; dosage; frequency; side effects</p> <p>Mode of information: verbal information from physicians; written information from pharmacists</p> <p>Physicians inquire about adherence at follow-up appointments</p> <p>Consult physician before modifying medication frequency or discontinue use</p> <p>Family member involvement: physician answer questions asked my family members</p>	<p>“Well, the doctor tells me verbally but, the pharmacist will give me a printed fact sheet about the medication that I am taking. That is how I found out about side effects for Ramipril. I was developing a dry cough while taking it and by reading one of the print-outs on the drug provided by the pharmacist. I called the pharmacist, they told me to call the doctor (which I did) and they changed it immediately.” (Interviewee 5, male, 88 years old).</p>	<p>Medication information provided primarily by physician</p> <p>Type of information provided: dosage</p>	

(continued)

ONLINE TABLE 3. Continued

Theme	Canada (n = 9)		India (n = 14)	
	Description	Example of Evidence	Description	Example of Evidence
Medication affordability	<p>Majority of patients had medication coverage through an employer health benefits program, private insurance or the government (n = 6)</p> <p>Medication affordability was a barrier for patients without drug coverage (n = 3)</p> <p>The patients with affordability issue were unaware of government drug programs (n = 2) or were not able to qualify (n = 1)</p> <p>Medication dispensing fee: \$4–\$12 per medication</p> <p>Medication refill: every 90 days</p>	<p>“I have [the Ontario Drug Benefit Program], but they don’t pay for medications until you’re 65 years old. At 65 years old—they pay for some of the medications. I was going to try to go through Trillium but they provide a mish mash of useless information and it is redundant information that they are constantly requesting over and over. I can’t be bothered. If I die; I die.” (Interviewee 7, male, 62 years old)</p>	<p>Majority of patients received medication coverage through the central or state government scheme</p> <p>Medication refill: monthly</p>	<p>“We are poor people. If we really were to buy medicines from outside, we would die. Thankfully we get free medicines from the government. We get free medicines from the hospital itself. We come here once in a month. Get all the medicines from the hospital itself.” (Interviewee 8, 62-year-old male)</p>
Medication accessibility	<p>Prescriptions obtained from community pharmacies</p> <p>Pharmacies located in close proximity to the patients</p> <p>Source of obtained prescriptions: patient or family member picked up medications; free pharmacy delivery</p>		<p>Prescriptions obtained from community pharmacies, hospital formulary</p> <p>Lack of hospitals and distance to hospital</p>	
Psychosocial factors	<p>Reasons to take medications: belief that medications will prevent reoccurrence; improved quality of life; life longer; instructed to by physician or family member</p> <p>Reasons to not take medications: denial over having to take medications for a prolonged period of time; stigma; side effects</p>	<p>“All the side effects aren’t worth it. Living longer isn’t worth the decrease in quality of life from taking the medications every day.” (Interviewee 8, female, 88 years old)</p>	<p>Reasons to take medications: medications promote health; not taking medications will result in death; instructed to by physician</p> <p>Reasons to not take medications: side effects; cost</p>	
Medication usage and routine	<p>Perceptions of health: patients took medications when feeling healthy</p> <p>Missed medication dose: resumed prescribed medication schedule without doubling up on missed pills</p> <p>Majority of patients did not forget to take medications</p> <p>Memory aids: pill organizer; designated time or meal; reminder from family member</p>	<p>“I have a pill container that goes for 7 days (Saturday–Sunday). I take the majority of [my medications] in the morning with breakfast. I take the cholesterol pill just before I go to bed.” (Interviewee 4, male, 85 years old)</p>	<p>Memory aids: designated time; reminder from family member</p>	<p>“[Medication] is put along with the breakfast. We both remind each other. In fact we don’t need reminders. Our belief is that we take our medicines, if the almighty up there has different designs for us, no medicine can stop it, but we don’t want to take chances.” (Interviewee 4, 74-year-old male, on medication for 26 years)</p>

ACE-I, angiotensin-converting enzyme inhibitors.

ONLINE TABLE 4. Key AYUSH practitioner themes and examples of the evidence

India (n = 5)		
Theme	Description	Example of the Evidence
Prescription practices	<p>Medications prescribed: aruina; dashamularishtam; tapayadiholoha; digitalis; spongia; cactus grindelia</p> <p>Methods to keep up-to-date on medications: Internet; medical journals; training activities</p> <p>Personalized treatment due to the lack of AYUSH guidelines for cardiovascular disease</p> <p>Factors considered when prescribing medications: age; health history; availability of medications; patient socioeconomic status</p>	<p>“Treatment is customized according to the person. Like in allopathy for certain symptoms we can prescribe paracetamol to any kind of person. Ayurveda does not work that way.” (Interviewee 1, male, 150 patients per day)</p>
Adherence checking	<p>High patient adherence to treatment: approximately 90%</p> <p>Methods to check adherence: lab tests; monitoring for signs of improvement</p> <p>Minimal side effects to treatment</p> <p>Low cost of AYUSH compared with traditional medication costs</p>	<p>“[The factors affecting adherence to medicines] Convincing ability actually and I am happy to say that most of my patients are compliant. I will take my due credit (AYUSH people) irrespective of the age or gender we can convince. For women we also call the mother in law or the husband for proper counselling and intervention.” (Interviewee 1, male, 150 patients per day)</p>
Medication counseling	<p>Mode of information: verbal</p> <p>Information provided: dosage and timing of medication</p> <p>Joint decision making: patient and family members involved in treatment planning</p> <p>Follow up with patients by telephone</p> <p>Time constraints affect abilities to care for patients</p>	<p>“[Counseling for lifestyle changes] Yea they do. I make sure they do. Allopathy doctors don’t have that much time to give even though I see a lot more patients.” (Interviewee 2, male, 75 patients per day)</p>

AYUSH, Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy.

ONLINE TABLE 5. Key nurse themes and examples of the evidence

India (n = 3)		
Theme	Description	Example of Evidence
Knowledge and attitude	<p>Educational qualifications: Diploma in nursing and midwifery (n = 2)</p> <p>Experience: 20–24 years</p> <p>Majority were not able to articulate the difference between primary and secondary prevention (n = 2)</p> <p>Knowledge of the commonly prescribed cardiovascular medications and their functions including combination pills</p> <p>Lack of knowledge about cardiovascular guidelines</p> <p>Method of keeping up-to-date on medications: consulting physician; medication labels</p> <p>Absence of formal training or rounds for nurses</p>	<p>“Many workshops/conferences take place in the hospital but the higher authorities send only a few from the whole nursing staff and not all. They don't support us. They should have regular in training program for the updates in the area of cardiology. They should send us in rotation with mandatory attendance.” (Interviewee 2)</p>
Work-related practices	<p>Hospital service: majority work on the cardiac service</p> <p>Number of patients: 6–30 patients per day</p> <p>Time constraint was not considered a barrier to their ability to care for patients</p> <p>Nurses were not included in treatment planning with physicians</p>	<p>“Doctors come for rounds in the wards, we interact with them only during that time. There are no separate meetings for discussing patient treatment plan.” (Interviewee 1)</p>
Counseling	<p>Discharge summary information included discussion of the medication dosage, frequency, timing, side effects, and contraindications</p> <p>Mode of information provided: verbal</p>	<p>“During discharge we hand in the discharge summary which contains information about dosage, timing and frequency. We don't provide any other information. These days patients are very educated you see.” (Interviewee 2)</p>
Adherence checking	<p>Patient adherence is dependent on the quality of counseling provided by health care practitioners</p> <p>Most patients are aware of the health consequences of nonadherence</p> <p>Barriers to adherence: incorrect information from medical staff; difficulty understanding the information provided about the medication; high pill load; absence of proper follow-up by health care practitioners</p> <p>Methods for checking adherence: check biological markers</p> <p>Free, generic pharmacies in low accessibility areas will improve adherence</p>	<p>“I don't think cost is the main reason why patients don't take meds as meds like aspirin is not that expensive. Low awareness levels of patients is the main reason.” (Interviewee 3)</p>
Patient follow-up	<p>Telephone or SMS-based follow-up was not used</p>	
Task shifting	<p>Supportive of NPHW prescribing medications</p> <p>Willing to complete short-term certification to be able to prescribe cardiovascular medications</p> <p>Felt that short-term training would be sufficient for providing them with the necessary knowledge to be able to prescribe medications</p>	<p>“We are capable of giving medicines to patients in emergency situations based out of our experience. If we are given training and authority then we will become competent enough to be able to prescribe medicines and take up follow up cases in the OPD.” (Interviewee 3)</p>

OPD, outpatient department; SMS, short message service.

ONLINE TABLE 6. Key hospital administrator themes and examples of the evidence

India (n = 4)		
Themes	Description	Example of the Evidence
Knowledge and attitude	Educational qualifications: majority had completed a masters in hospital administration Work experience: ranged from 8 to 35 years Half were aware of evidence-based medication use in secondary prevention	
Hospital management	Designated hospital administrator for the cardiology department, responsible for overseeing the outpatient department, wards, nursing staff, and the intensive care unit One-half of the hospitals maintained electronic health records Hospital and hospital pharmacy not accredited by the National Accreditation Board for Hospitals Healthcare Providers (NANH) Most were accredited by the Drug Controller General of India (DCGI) or International Organization for Standardization (IOS)	"Our hospital pharmacy is not accredited however accreditation is provided by many organizations like NAPH, we are not government hospital and we don't have accreditation." (Interviewee 3)
Human resource development	Capacity building programs offered weekly to every 3 months Programs included: workshops; seminars; conferences Physicians were not supported financial to attend international conferences or conduct research	"For nurses also; they are allowed to attend the conferences, and some maybe allowed to do some post-graduation advance courses and for doctors fellowships are there. Commonwealth fellowships, WHO fellowships, capacity building, knowledge wise, skill wise all the skill development systems are in place." (Interviewee 4)
Patient care practices	Suboptimal physician-patient ratio Number of patients seen in the cardiology department per day: 160 to 1,000 patients Counseling materials such as pamphlets or booklets are seldom used Involvement of family members in patient care to facilitate decision making Telephone or SMS follow-up not utilized	"Only one senior head and 7 surgeons for the complete patient load. Suboptimal doctor-patient ratio." (Interviewee 3)
Prescription practices	One-half reported following the Medical Council of India guidelines for maintaining a standard list of generic medications Not-supportive of OTC medications and limited availability of OTC medications including aspirin High medication costs reduce adherence Lack of consensus on the value of evidence-based medication practices, subsidizing medication costs, and cashless treatments for patients	"The hospital is having policy of prescription of generic medicines and no special brands are promoted in the hospital including cardiology department. The doctors have the full flexibility of drug prescription based on their clinical description but they prescribe in generic format and standard treatment protocols are followed in the hospitals." (Interviewee 3)
Hospital pharmacy management	Regulatory policies for medication dispensing Medication delivery not available	
Access to hospital services	Most offered the same medical treatment to patients irrespective of their socioeconomic status Private hospitals offer subsidized rates for lower-income patients Most hospitals reserved a set number of beds, offered coverage under the government scheme and provided free medical treatment for Below the Poverty Line card holders	"Basic problem is infrastructure. So every day at least in cardiology and cardiac thoracic surgery at least 50 admissions are needed but we hardly take 10–15 admissions due to lack of bed." (Interviewee 4)

NAPH, National Association of Public Hospitals; OTC, over the counter; WHO, World Health Organization.

ONLINE TABLE 7. Key social worker themes and examples of the evidence

Canada (n = 1)		
Theme	Description	Example of the Evidence
Time restrictions	<p>One social worker responsible for the cardiac beds</p> <p>Social worker staffed during business hours on weekdays only</p> <p>Provides counseling to patients with poor medical prognosis, lack of family support, financial difficulties or no medication coverage, complex treatment plan</p> <p>Patients seen per day: 8–15 patients; prioritized by hospital code and referrals from the charge nurse and physicians</p> <p>Prefers informal requests for social worker consults to minimize the time lost from completing a formal request</p> <p>Patient interaction is limited to the hospital-setting and outpatient counseling does not occur</p> <p>Community-based follow-up by a social worker would be beneficial to patients</p>	<p>“One of the nurses, therapists or doctor’s will grab me and tell me about a certain patient and voice their concern that they think that there may be a problem for this particular patient in whichever regard it may be. I am supposed to wait until it comes officially from a doctor’s order, but we don’t usually work like that simply because we are usually in a hurry for a doctor to write the order and then wait. I find that too time consuming and too formal for me and my colleagues let me get away with that. Other colleagues will not allow you to get away with that.” (Interviewee 1, female, 54 years old).</p>
Affordability and financial resources	<p>Majority of patients seen have difficulties affording the cardiovascular medications</p> <p>Patients referred to government programs that offer drug coverage: Ontario Trillium Benefit Plan; Ontario Works; Ontario Disability Support Program</p> <p>Patients are unable to qualify for the government programs without demonstrating dire financial need and submitting tax returns</p> <p>Medication coverage takes several months to come into effect</p> <p>Employment insurance only allows for 15 weeks of financial support</p> <p>Additional strategies to improve affordability include borrowing money from family/friends, charging medication costs to credit cards, requesting medication samples from physicians</p> <p>Social workers are the primary health care professional responsible for discussing financial resources</p> <p>Majority of patients are unaware of government medication programs</p> <p>Dissatisfied with resources available to patients</p>	<p>“We will go through all of the things that are available to them through government/provincial programs. I suggest that if they file their income tax they can apply for Trillium. I suggest also that they get a family member to help with that, as well as filling out the paperwork required for Trillium because it can be a bit excessive. I can make a file for the Trillium (application), but they/I have to make a note as to why they haven’t filed for their income tax and hopefully the application gets accepted. If it doesn’t that is when I suggest that they file their taxes and then reapply to Trillium. The issue with that is even if they do file their income tax-it takes 2–3 months to get drug coverage and most people who work for cash do not want the government to get involved. So, that becomes a write-off because most of the time the people will not opt to file their taxes. From there they can apply for OW or ODSP, but that requires a very extensive financial assessment and you can’t have more than \$5,000 in assets, so basically that person would do a telephone interview with that particular office to ensure that they do or do not qualify; if they can prove with their bank statements that they have very little.” (Interviewee 1, female, 54 years old)</p> <p>“A lot of the times, I finish with a patient and I have to apologize because I had nothing good to say to them to help out with their situation.” (Interviewee 1, female, 54 years old)</p>

ODSP, Ontario Disability Support Program; OW, Ontario Works.

ONLINE TABLE 8. Key pharmaceutical company themes and examples of the evidence

India (n = 2)		
Theme	Description	Example of the Evidence
Health challenges	Health care financing needs to be taken care of Majority of patients have difficulty affording these medications that need to be taken life-long	"I think the challenges everybody knows what the challenges in health care are currently. I think no. 1 being the disease burden, the no. 2 being health care financing. The two are probably the biggest challenges." (Interviewee 1)
Medication affordability	With a population belonging to varied socioeconomic strata, affordability is a major issue Central procurement of drugs is necessary as this would ensure both affordability and accessibility to drugs	"Central procurement of drugs is something completely necessary. Please understand that we are probably the only country in the world where the government does not take the responsibility of taking care of its citizens. In every other country government procures drug, provides this to all or at discounted prices to the patients. In India is all left to the patient to do it on their own and then the resultant is that industry has been given...you know...push the responsibility of taking care of the patients in this country." (Interviewee 2)
Capacity and technical aspects	Need to focus more on research and development More capacity building and technical support programs should be arranged by the government; these are currently mostly provided by medical representatives Need to create awareness by the government about primary and secondary prevention of CVD	"I think in India we hardly have R&D happening. We have some development happening but research is very limited in nature. I don't think we do much about it." (Interviewee 2) "The government should thank the medical representative [for] the country for taking on their jobs and providing necessary education to the doctors. The industry follows some very strict rules in how they interact with medical community so that there is no undue influence on medical fraternity but is restricted to creating more environment around medical education." (Interviewee 1) "Tell me...has government or political parties or the media who has done any effort to really help in increase awareness on world heart day...it is all meant to the pharmaceutical companies. Similarly pharmaceutical companies with the help of interested doctors are the only ones which are creating awareness on such different disease area that now you'll see the same next one on world diabetes day on 14th November again you'll see that only pharmaceutical companies and interested doctors are the only ones who takes interest and do something and rest everybody is absent." (Interviewee 1)
Policy regulation and implementation	Lack of implementation of the available policies The policies and regulations for pharmaceutical companies are extremely strict; they could be relaxed a bit for more production and research that could help increase availability of drugs	"We do have (price control policy). There is a completely failed policy called 'national pricing authority' with these price control order which just completely failed in creating access. I hope you have read recent IMS Health study which has clearly shown that in India price control order has not increased the access, it is been a total failure." (Interviewee 2) "Government should focus on creating awareness, instead government only focuses entirely on regulating prices, regulating industries and regulating the conduct but should focus on creating awareness, more and more health care financing and private insurance." (Interviewee 1)

CVD, cardiovascular disease; IMS Health study, Information System Management Health study; R&D, research and development.

ONLINE TABLE 9. Key policy maker themes and examples of the evidence

Theme	Canada (n = 2)		India (n = 3)	
	Description	Example of Evidence	Description	Example of Evidence
Roles and responsibilities	Responsible for conducting patient-oriented research on health, and health system outcomes	<p>“My current responsibilities are that of the lead in the province of organizing a portfolio of patient-oriented research that can have an impact of the evolution of health care in the province. I do this from a policy research background and clearly drugs are a big part of our policy package.” (Interviewee 1)</p> <p>“I would say generally speaking, the minister bears substantial responsibility for health system outcomes and tried to transition the ministry to be more involved in stewardship and therefore, less involved in day-to-day operations; in order to be able to do that, you need to create a structure where you can maximize outcome by organizing (in some cases) around a disease-specific way and creating protocols which would apply across all of Ontario.” (Interviewee 2)</p>	Responsible for capacity building; conducting research; policy planning; strategy development; advocacy at regional, national, and international levels	
Health challenges and demographic profile	<p>Chronic diseases are not considered in isolation by policy makers</p> <p>Consider how treatments work for a population as a whole and within different ethnic groups residing in Canada</p> <p>Aging population and increased need to fund health care</p>	<p>“From my knowledge and participation in government; we don’t see chronic diseases in isolation. It is actually ‘better off’ or ‘worse’ lumped together. Again with a hierarchy, with the number of patients in each diseased group but it is not taken; unless it comes to a particular issue such as putting a new drug on the formulary or looking at a new intervention that needs to be regulated for that particular disease. So, otherwise, it generally get ‘lumped.’” (Interviewee 1)</p>	Lack of equal access to care, affordability of treatment were large barriers to adherence	
Capacity and technical aspects			Guidelines for noncommunicable disease prevention: National Prevention Program for Prevention of CVD, Diabetes, Cancer, and Stroke (NPCDCS)	

(continued)

ONLINE TABLE 9. Continued

Theme	Canada (n = 2)		India (n = 3)	
	Description	Example of Evidence	Description	Example of Evidence
Policy formulation process	<p>Funding priorities determined at the municipal, provincial, and federal government levels</p> <p>Factors considered with developing policies: peer-reviewed scientific publications; media coverage; formal and informal lobbying; cost evaluation; disease severity; gaps in care; feedback from academic community and health care workers; context; applicability</p>	<p>“Generically, the government decides based on research and what they hear from the academic community and the practitioner of the community. They make decisions on what would be the best use of the public dollars that have been invested in health. It can happen in many ways, it can happen through media, or whatever.” (Interviewee 1)</p> <p>“A lot of times there is a consensus that ‘X’ would be beneficial; but, a lot of the times the bigger challenge is to make a way an additional cost that comes with ‘X’ fits within the budgetary constraint. Sometimes, it’s ok because it is just a judgment call between ‘X’ and ‘Y’ and at the end of the day—you have to rely on your own judgment. A lot of times it is like: Yes, it would be beneficial to make progress around this but a lot of times the decision goes down the line to the ‘end-line decision maker.’ So, I have to find a way to move it forward down the line to the ‘end-line decision maker.’” (Interviewee 2)</p>	<p>Information sources: national surveys; program based data on screening; published data from health agencies</p> <p>Noncommunicable disease risk factor surveillance and economic analyses should also inform policy development</p> <p>Factors considered when developing policies: economic feasibility; cost effectiveness; scientific evidence; capacity building of the physicians; raising awareness and availability of evidence-based drugs</p> <p>Lack of consolidated evidence to inform policies</p> <p>Robust evidence is important, but local data are given more weight</p>	<p>“So in informing policy makers there is robust evidence like there is large study done in the health system showing large improvement and has been published in a major journal. It’s eye-catching for the government and it will be easier to liaison with the govt. So if you have evidence you are on a stronger wicket to argue with the gov[ernment]. That’s very difficult to say because in a country like India it’s [t]he eminence of the person who advocates the gov[ernment]. That and if that person is empowered with evidence then it will be much more.” (Interviewee 3)</p>
Policies and programs	<p>Provincial governments negotiate and purchase medications</p> <p>Negotiating power can be increased by drug purchasing at a federal level</p> <p>Recommendations to improve adherence: universal drug program; telemedicine network; support patient self-management; standardization of guidelines</p>	<p>“The time has long come to look at a universal drug strategy. I think that would answer the poverty issues and the equity issues.” (Interviewee 1)</p> <p>“There is a need for system standardization or dissemination of guidelines and some of this is the lowest cost stuff you can do; sort of training a trainer sort of mindset. You get a bunch of bright people here to standardize a protocol to disseminate it to the rest of us. And in places where the health care performance expectations [are] lower these advances from these relatively low cost solutions is huge.” (Interviewee 2)</p>	<p>Recommendations to improve medication affordability: essential medications covered by government schemes; track medication use; increase production of combination pills; central procurement of drugs; tax incentives for new medications</p> <p>AYUSH medicine can complement allopathy</p> <p>Community health workers are underutilized for follow-up and counseling</p>	<p>“I think the best way to do, as said is central procurement because the markup for drugs in India is very high and central procurement can reduce the cost. That’s no. 1. Encouragement R&D to you know create drugs like polypills for example. Third is tax breaks for new drugs manufactured within India. So those are some of the things that you can do.” (Interviewee 3)</p>

(continued)

ONLINE TABLE 9. Continued

Theme	Canada (n = 2)		India (n = 3)	
	Description	Example of Evidence	Description	Example of Evidence
Strategies for better decision making			<p>Research needs to be made available to inform policies</p> <p>Researchers should work with government agencies to disseminate findings</p>	<p>“I think the researchers are sitting in their ivory towers, and they don’t go as much and talk to the government. They should inform the government at every stage when they are planning their proposal to know what are the key priorities. They should be involved in the program. They should go up and visits to see what are the barriers, you know at the state, district, and grass-root level. They should be involved in the program to know correctly what are the research gaps and questions. They should prioritize those research problems which are a problem for the government. And for the program. Not what fancies them, or fancies the donor. That’s one. And second, they should keep the government, policy makers informed, and they should provide the results and, uh, I think there also needs to be more interactions with the stakeholders, also to publicize the results, through social media and other channels, to make the results public aware, so you know there is a demand for those services.”</p> <p>(Interviewee 2)</p>

Abbreviations as in [Online Tables 1, 6, and 10](#).

ONLINE TABLE 10. Key NGO themes and examples of the evidence

India (n = 3)		
Theme	Description	Example of the Evidence
Organizational roles and responsibilities	Involved in the development of health care reform, and conducting research related to reducing the burden of cardiovascular disease Collaborate with the ministry of health, physician groups, public health foundations, and health technology manufacturers	"We have been focusing and working with leaders in private sectors and in the ministry of health building large framework for how to reform the Indian health care system and we have really been focusing on 3 major areas: One is how can you build country-wise capacity of preventing the growth and incidence of the chronic disease. Second is how can we do a better job of surveillance and early detection. And third is how can we work with patients who have multiple chronic disease, keep them healthy and keep them out of the hospital and out of clinics and so on." (Interviewee 1)
Knowledge and attitudes	Health challenges: underinvestment in health; lack of human and physical delivery system infrastructure; and public health prevention system Medication affordability is an issue Barriers to adherence: lack of awareness; medication cost; absence of expertise at the PHC level	
Specific roles in secondary prevention	Created awareness about secondary prevention by working with stakeholder groups and the government Advocacy	
Involvement in policy	Factors that affect policy planning and implementation: funding; manpower shortage; lack of awareness among health care professionals and patients; lack of government policies focusing on noncommunicable disease prevention Research findings guide policy development	"First you need to generate the evidence. Then you have to advertise it publically. If you publish it in a journal very few people will read it; not all doctors will read it. So you have to provide the evidence first. These are the outcomes. Then you can talk to policy maker and then they can suggest. Changing policy is very difficult. It is not an easy job." (Interviewee 2)
Innovative strategies for CVD reduction	Subscription-based primary care clinics and centers	

CVD, cardiovascular disease; NGO, nongovernmental organization; PHC, primary healthcare.