A PILOT STUDY ON COST-RELATED MEDICATION NONADHERENCE IN ONTARIO

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ABSTRACT

Background
Cost-related nonadherence (CRN) describes patients cutting back on their prescribed medication due to an inability to pay. CRN is influenced by drug insurance coverage plans, which vary widely among different healthcare systems. Little is known about CRN in Canada and Ontario.

Objective
To develop and pilot a questionnaire about CRN.

Methods
An interviewer-administered questionnaire assessing demographics, socioeconomic status, health status and health literacy, medication costs and CRN was developed for this pilot study. Participants were recruited from a general internal medicine rapid assessment outpatient clinic of a large urban teaching hospital.

Results
Sixty patients were recruited (mean age 60.3 years; 48.3% female; mean of 5.3 prescription medications per patient). Nine patients (15%) reported some form of CRN. Unfilled prescriptions, delayed prescriptions, less frequent and smaller doses were the most common forms of CRN. Seven patients (11.7%) had no drug insurance. Patients without drug insurance were more likely to experience CRN than patients with private insurance (OR 20.70, 95% CI 1.46-292.75); government coverage also increased the likelihood of CRN compared to private coverage (OR 4.51, 95% CI 0.376-54.11). Patients spending over $100 a month out-of-pocket were more likely to experience CRN than patients spending less than $20 (OR 42.52, 95% CI 2.02-894.03). Thirty-three patients (55%) said that their physicians had not asked them about how they deal with the cost of prescriptions.

Conclusion
Based on our pilot survey, a significant minority of specialty clinic outpatients experience CRN and prescribers frequently forget to inquire whether patients can afford their medications.

Key Words: *Prescription medication costs; adherence; survey; internal medicine clinic; Ontario*

The cost of prescription medications is thought to be a barrier for many patients to access the healthcare they need. Cost-related nonadherence (CRN) is defined as any form of medication underuse because of cost, including unfilled prescriptions, delayed prescriptions, smaller doses and less frequent doses.[1-4] Randomized trials have shown that poor adherence to therapeutic medication and placebo are both related to higher mortality rates.[5] Not only does poor adherence increase adverse outcomes for patients, but it also unnecessarily inflates health care spending

because of wastage.[2] In the absence of insurance coverage, CRN is considered to be a common reason why some patients do not respond to pharmacotherapy.[4] In addition, patients who underuse medication due to cost are more likely to experience complications of their condition, resulting in increased healthcare ultilization.[6,7]

In the United States (US), 18% of individuals under 65 years of age have no health insurance at all.[2] Among the insured, almost 20% are underinsured due to high deductibles and co-payments.[8] It is not surprising, then, that overall rates of CRN in the US have been shown to range from 18% and 28%.[1,2] It has also been estimated that these cases of CRN cause 33-69% of medication-related hospitalizations.[7] Although Canada is often viewed internationally as a publicly-funded healthcare system, none of the government health insurance programs across the country include universal prescription drug coverage. Canadians and Americans have been shown to have roughly the same amount of out-of-pocket spending on prescription drugs when calculated as a percentage of their income.[9] In Ontario, the majority of citizens have some form of private drug insurance—usually through their employers—that covers most or all of their drug costs.[2] Approximately 20% of Ontario citizens—those over 65 years of age, on social assistance or in long-term or home care—are covered by the Ontario Public Drug Benefit.[10] Specific disease groups, patients on disability and patients who incur catastrophic drug expenses because of their illnesses are also covered by various government programs.[10] It is estimated, however, that approximately 18% of Ontario citizens have no drug insurance at all.[11] Furthermore, these people generally belong to a group identified as the 'working poor' and are thought to be the most susceptible to CRN. This group includes low-income Canadians, young adults and those who are self-employed.[12] They generate an income, but are not able to support themselves or their families sufficiently to purchase additional insurance. Other Canadian provinces also offer public drug plans but the extent of coverage varies widely between jurisdictions.[13]

A structured literature search of MEDLINE from January 1996 to January 6, 2012 for studies of medication adherence and cost in Canada revealed only two studies addressing adherence to medications in general, as opposed to a specific medication type. A recent study reported Canadian rates of CRN to be around 8% with the highest rates from provinces with income-based prescription drug coverage – British Columbia, Manitoba and Saskatchewan.[2] Data were used from an international telephone survey that measured CRN by asking respondents whether they skipped doses or left prescriptions unfilled because of cost in the past 12 months. Another recent study reported the Canadian prevalence of CRN to be 9.6%.[14] Data from this study were obtained from another telephone survey that asked respondents whether they did anything to make their prescriptions last longer, did not fill a new prescription or renew a prescription.[14] The highest rate of CRN was found in British Columbia.[14] Poor health, low income, and no drug coverage were strong predictors of CRN.[14]

Many factors have been shown to influence the likelihood of CRN, including insurance coverage, demographic and socioeconomic factors, disease status and health literacy.[1,2,14-16] Poor health status, either self-reported or as a count of comorbidities, increased the risk of CRN.[15] Patients with chronic illnesses such as arthritis, asthma, depression, back pain and stomach ulcers are most likely to experience CRN.[4] For example, low-income patients with diabetes do not benefit as much as high-income patients from newer, more effective treatments.[17] Also, patients with epilepsy have been shown to suffer from poor medication adherence due to socioeconomic status.[18] Low health literacy has also been shown to negatively affect medication adherence, though its connection with CRN is still unclear.[16]

Efforts by provincial governments to reduce prescription drug costs from the healthcare budget through various cost-sharing methods have led to negative clinical outcomes, especially for vulnerable populations.[19] Since drugs account for the second-largest share of Canadian health expenditure—16.4% of total health expenditures in 2009—there are strong incentives to limit drug benefits without harming health.[20] Given the shortage of recent research on this important question, we developed a pilot study to examine the prevalence and predictors of CRN in a sample of Canada's largest province, Ontario.

METHODS

Research ethics approval was obtained from the Student Research Committee of the Hamilton Health Sciences/McMaster Faculty of Health Sciences Research Ethics Board. We developed a 28-item questionnaire with a mix of open- and closed-ended questions based on a literature review of similar studies and personal communication with members of the Pharmaceutical Policy Research Collaboration.[21] Information about patient demographic and socioeconomic status, health status and health literacy was collected first. Questions for self-reported health status and physician usage were adapted from the Health Survey of England.[22] Health literacy was assessed by asking questions about self-perceived ability to read, the use of a surrogate reader and confidence in filling out medical forms because these questions have been shown to quickly and effectively identify patients with low literacy.[23] We then asked patients whether they had drug insurance coverage, and if they did, what type of copayment and/or deductible they had. To assess CRN, we asked patients to think back in the past year and describe how frequently they left prescriptions unfilled, delayed filling prescriptions, took prescriptions with reduced frequency and lowered dosages because of the cost. The final section of the questionnaire contained questions adapted from a previous study investigating drug adherence among seniors in Quebec City and were designed to collect additional information about patient adherence to medication without consideration for cost.[24]

The questionnaire was pretested for timing, flow and comprehensibility with a convenience sample of laypersons and research staff (n=5). The questionnaire length was timed at less than 15 minutes. Based on pretesting, we incorporated improvements into the subsequent version. Patients of the General Internal Medicine Rapid Assessment Outpatient Clinic of McMaster University Medical Centre in Hamilton, Ontario were asked to participate in face-to-face interviews. This clinic treats patients referred from the Emergency Department or in follow-up for a recent admission requiring Internal Medicine expertise. Inclusion criteria included fluency in English or presence of a suitable translator and age over 18 years. Exclusion criteria included cognitive impairment or refusal to participate in any part of the questionnaire. Cognitive function was screened using a validated 6-Item Cognitive Impairment Test (6CIT), which is highly correlated with the Folstein mini-mental exam.[25] It has a sensitivity of 92.1% and a specificity of 95.6% at the cut-off of 6 points that we used.[25] A list of each patient's medications was provided based on individual interview by the staff pharmacist of the clinic, who also noted general problems that the patient might be having with medications.

Data analysis was primarily descriptive. Using a multivariate model, we examined age, insurance coverage, copayment and out-of-pocket expenses as possible predictors of CRN. Data analysis was performed using SAS v9.2 (SAS Institute, Inc., Cary, North Carolina).

RESULTS

A total of 60 patients participated in the study from March 10, 2011 to April 19, 2011. Table 1 summarizes the demographic, socioeconomic, medication details, health status and literacy status of the survey participants. Fifty-three patients (88.3%) were on at least one medication and the mean number of prescription medications among all patients was 5.3. Fifty-three patients (88.3%) were covered by either private insurance or government programs. Among the 35 (58%) patients with private insurance, 71.4% of them had some form of copayment or deductible. Private insurance co-payments ranged from 50 cents per prescription to 50% of the total cost of the prescription. Patients who were covered under the government welfare program Ontario Works and the Ontario Disability Support Program had a copayment of $2 per prescription. Low-income senior patients covered under the Ontario Public Drug Benefit Program also had a copayment of $2 per prescription. High-income seniors pay $100 annually plus $6.11 for each prescription. Four patients had private insurance plans that did not cover specific medications they were taking including acetylsalicylic acid (Aspirin), sildenafil (Viagra), tadalafil (Cialis) and iron. Thirteen patients (21.6%) said their reading skills were fair or worse, fifteen patients (25%) reported asking for help to read materials that they receive from the hospital/clinic and nine patients (15%) were not confident about filling out medical forms. Some patients who had low literacy visited the hospital with a translator, who was usually a family member.

TABLE 1 Patient Characteristics

	n (%)
Age	
Mean (± SD)	60.3 (± 14.3)
Range	24-90
Sex	
Female	29 (48.3)
Ethnic background	
Caucasian	41 (68.3)
Other	19 (31.7)
Highest level of education	
No high school	19 (31.7)
High school	21 (35.0)
College or other post-secondary	13 (21.7)
University	6 (10.0)
Post-graduate or higher	1 (1.7)
Annual household income	
< 20 000	14 (23.3)
20 000 – 40 000	15 (25.0)
40 000 – 70 000	17 (28.3)
70 000 – 100 000	4 (6.7)
> 100 000	8 (13.3)
Number of prescription medications	
0	7 (11.7)
1-3	16 (26.7)
4-6	14 (23.3)
7-9	12 (20.0)
> 9	11 (18.3)
Mean (± SD)	5.3 (3.7)
Prescription drug insurance coverage	
Private	35 (58.3)
Government	18 (30.0)
No coverage	7 (11.7)
Monthly out-of-pocket prescription expenses	
< 20	36 (60.0)
20-100	18 (30.0)
100-200	4 (6.7)
200-300	1 (1.7)
> 300	1 (1.7)
“How would you describe your health?”	
Very good	1 (1.7)
Good	22 (36.7)
Fair	23 (38.3)
Bad	10 (16.7)
Very Bad	4 (6.7)
“In the past year, how many times have you consulted a physician?”	
0	3 (5.0)
1	1 (1.7)
2	7 (11.7)
3	15 (25.0)
4 or more	34 (56.7)
“Do you usually ask someone to help you read materials you receive from the hospital/clinic?”	
Yes	15 (25.0)
No	45 (75.0)
“How confident do you feel about filling out medical forms by yourself?”	
Not confident at all	3 (5.0)
Somewhat not confident	6 (10.0)
Somewhat confident	16 (26.7)
Confident	17 (28.3)
Very confident	18 (30.0)
“How would you rate your ability to read?”	
Very good	29 (48.3)
Good	18 (30.0)
Fair	9 (15.0)
Bad	2 (3.3)
Very bad	2 (3.3)

Nine patients out of 60 (15%) reported some form of CRN in the past year (Table 2). These patients were included in the group of 14 patients (23.3%) who said that they had to think about money when obtaining prescription medications. Not surprisingly, the group of patients with no drug insurance coverage had the highest proportion of people who experience CRN (71.4%). Patients with public insurance had the second highest rates of CRN (11.1%) and patients with private insurance experienced the lowest rates of CRN (5.7%).

TABLE 2 Relationship of cost-related nonadherence to insurance coverage

	Some form of CRN (n (%))	No CRN (n (%))	Total (n (%))
Private	2 (5.7)	33 (94.3)	35 (58.3)
Government	2 (11.1)	16 (88.9)	18 (30.0)
No coverage	5 (71.4)	2 (28.6)	7 (11.7)
Total	9 (15.0)	51 (85.0)	60 (100.0)

Using multivariate analysis, we found insurance coverage and out-of-pocket expenses to be statistically significant predictors of CRN (Table 3). Patients with no drug insurance were much more likely to experience CRN than patients with private insurance (OR 20.70, 95% CI 1.46-292.75). Government-provided coverage also increased the likelihood of CRN compared to private insurance (OR 4.51, 95% CI 0.376-54.11). Patients spending over $100 a month out-of-pocket were much more likely to experience CRN than patients spending less than $20 a month (OR 42.52, 95% CI 2.02-894.03).

TABLE 3 Predictors of cost-related nonadherence

	OR (95% CI)
Prescription drug insurance coverage	
Private	1.00
Government	4.51 (0.38 – 54.11)
No coverage	20.68 (1.46 – 292.75)
Monthly out-of-pocket prescription expenses	
< 20	1.00
20-100	3.17 (0.30 – 34.02)
> 100	42.52 (2.02 – 894.03)

Among the nine patients who experienced CRN, the most common behaviours were leaving prescriptions unfilled, delaying filling prescriptions, taking medications less frequently and taking medications in smaller doses (Table 4). Four patients (44.4%) used price as a factor to decide on which medications to cut back while another four (44.4%) used their own judgement as to how necessary the medication was. Six patients (66.7%) reported telling their doctors about cutting back on medications. Five patients (55.4%) did not ask their healthcare providers for help in reducing prescription costs.

TABLE 4 Frequency of different types of cost-related nonadherence

	Never (n (%))	Rarely (n (%))	Sometimes (n (%))	Often (n (%))	Always (n (%))
Left a prescription unfilled	55 (91.7)	2 (3.3)	1 (1.7)	2 (3.3)	0 (0.0)
Filled some but not all prescriptions	56 (93.3)	1 (1.7)	2 (3.3)	0 (0.0)	1 (1.7)
Delayed filling a prescription	52 (86.7)	2 (3.3)	4 (6.7)	2 (3.3)	0 (0.0)
Decided not to refill a prescription	57 (95.0)	0 (0.0)	2 (3.3)	0 (0.0)	1 (1.7)
Took a medication less frequently	55 (91.7)	2 (3.3)	2 (3.3)	0 (0.0)	1 (1.7)
Took a medication in smaller doses	54 (90.0)	1 (1.7)	2 (3.3)	1 (1.7)	2 (3.3)

Among all patients, thirty-three patients (55%) said their physician had not asked about how they pay for medications. Twenty-nine patients (48.3%) felt that their physician did not consider the cost of medications before prescribing. Fifty patients (83.3%) never asked for a cheaper substitute in place of their prescribed medications. In assessing adherence to medication without consideration for cost, 21 patients (35.0%) had forgotten to take their prescribed medications. Eighteen patients (30%) said that they had stopped taking their medications after feeling worse and 12 patients (20%) said that they had stopped taking their medications after feeling better (Table 5).

TABLE 5 Self-reported adherence to medication without consideration for cost

	n (%)
"Do you ever forget to take your prescribed medications?"	
Yes	21 (35.0)
No	39 (65.0)
"When you feel better, do you ever stop taking your medications before the prescribed regiment is finished?"	
Yes	12 (20.0)
No	48 (80.0)
"If you feel worse after taking your medications, do you ever stop taking them?"	
Yes	18 (30.0)
No	42 (70.0)

DISCUSSION

In the present pilot study, we found that 15% of patients reported experiencing some form of CRN in the past year. The rate of CRN is slightly higher than previously reported in Ontario by Law et al. as well as Kennedy and Morgan.[1,2,4,14] In the Kennedy and Morgan study, Canadian residents were surveyed without regard to health or medication status so that respondents on no medications in the past year were counted as having no CRN problems.[2] However, Law et al. only surveyed respondents who received at least one prescription in the past year. The increased prevalence in our study could be attributed to the specific population of patients seen at this internal medicine clinic. They are likely to be older, have worse health status and be on more prescription medications than the general population.

Not everyone without drug insurance reported CRN. This result may be attributed to the differing levels of importance with which people view prescription medication. The Health Belief model of medication compliance, for example, suggests that patients will comply with medication instructions if they believe the benefits outweigh the costs.[26] Patients who view their medication as a top priority make the necessary arrangements, such as cutting back on other expenses, in order to access their medications.[27,28] Further, some patients who have private or government drug insurance coverage reported CRN. While most insurance and private programs have small copayments such as a discounted dispensing fee or 10% of the prescription cost, a few patients reported copayments as high as 50% of the prescription cost. Some private insurance plans make patients pay up front, before reimbursing them for their medication costs, which may also encourage CRN. These data are consistent with previous findings that show high out-of-pocket spending may be the strongest predictor for CRN.[15]

Over half the patients who experience CRN had not asked healthcare providers for help in reducing their costs. Patients may be embarrassed to tell their physicians when they cannot afford their medications or believe that it is not the doctor's job to deal with cost issues.[29,30] Physicians tend to lack knowledge about drug costs and may not be adequately trained to inquire about a patient's financial situation.[30,31] To bridge the gap in communication, physicians need to a) know the costs of the drugs they prescribe and b) ask whether prescription cost has been a problem for the patient. Patients should also be more vocal about their concerns regarding prescription costs and may need education about the relative importance of their various medications in comparison to other items they purchase. Patients who have a greater knowledge of their illness and medications are more likely to show persistence with therapy and patients who discuss prescription costs with their physicians are more likely to access patient assistance programs and free samples.[32,33]

Given that this was a pilot study, the relatively small sample size and single site we surveyed represent significant limitations. To make our results more generalizable, it would be beneficial to survey more patients and in more sites. The questionnaire may need to be revised to be self-administered or suitable for telephone interviewing, while preserving the ability to include patients with low literacy. As well, we have relied on self-report to provide estimates of CRN. These data would be much more robust if combined with prescription dispensing data. Future studies, while refining data on the prevalence, predictors and outcomes of CRN, should also further investigate the communications of provider and patient around drug costs.

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