Older Adults' Awareness of Deprescribing: A Population-Based Survey

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OBJECTIVES: To determine older adults' awareness of the concept of medication-induced harm and their familiarity with the term "deprescribing." Secondary objectives were to ascertain determinants of self-initiated deprescribing conversations and to identify how older adults seek information on medication harms.

DESIGN: Cross-sectional population-based household telephone survey using random-digit dialling.

SETTING: Canada.

PARTICIPANTS: Community-dwelling adults aged 65 and older (N = 2,665; n = 898 men, n = 1,767 women, mean age 74.9 ± 7.2, range 65–100).

MEASUREMENTS: Information was gathered on age; sex; awareness of the term "deprescribing"; knowledge and information-seeking behaviors related to medication harms; and previous initiation of a deprescribing conversation with a healthcare professional. Three targeted classes of potentially inappropriate prescriptions were asked about: sedative-hypnotics, glyburide, and proton pump inhibitors. Descriptive statistics and regression analyses were used to quantify associations.

RESULTS: Two-thirds (65.2%, 95% confidence interval (CI) = 63.4–67.0%) of participants were familiar with the concept of medication-induced harms. Only 6.9% (95% CI = 5.9–7.8%) recognized the term deprescribing; 48% (95% CI = 46–50%) had researched medication-related harms. Older adults most commonly sought information from the Internet (35.5%, 95% CI = 33.4–37.6%), and from health care professionals (32.2%, 95% CI = 30.1–34.3%). Patient-initiated deprescribing conversations were associated with awareness of medication harms (odds ratio (OR) = 1.74, 95% CI = 1.46–2.07), familiarity with the term deprescribing (OR = 1.55, 95% CI = 1.13–2.12), and information-seeking behaviors (OR = 4.57, 95% CI = 3.84–5.45), independent of age and sex.

CONCLUSION: Healthcare providers can facilitate patient-initiated deprescribing conversations by providing information on medication harms and using the term "deprescribing." **J Am Geriatr Soc 65:2691–2696, 2017.**

Key words: survey; questionnaire; deprescribing; potentially inappropriate medication; aged; primary health care

Medications are defined as inappropriate when the potential for harm outweighs the potential for benefit, particularly when safer alternatives exist.[1,2] There are a number of consensus documents for the avoidance of inappropriate medication in older adults, such as the Beers criteria and the Screening Tool of Older Persons' potentially inappropriate Prescriptions—Screening Tool to Alert to Right Treatment list.[1,2] Despite these recommendations, one-quarter of older adults take at least one potentially inappropriate prescription medication each year, increasing the risk of medication-related hospital admission and unnecessary expenditure for the healthcare system.[3] Seventy percent of older adults are willing to deprescribe a medication, yet the prevalence of inappropriate medications remains unchanged.[4]

Healthcare providers may be partially to blame for the persistent prescription of inappropriate medications. Fewer than 20% of family and internal medicine doctors consult criteria for potentially inappropriate medications when prescribing for older adults.[5] Fewer than 50% of community-based pharmacists are aware of the prevalence of potentially inappropriate medications in individuals aged 65 and older.[6]

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For additional details on the Canadian Deprescribing Network, see reference 21.

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Patients also have a role to play in decreasing inappropriate prescriptions. In the Eliminating Medications Through Patient Ownership of End Results (EMPOWER) study, direct-to-consumer education about the potential harms of sedative-hypnotics led 62% of trial participants to discuss deprescribing with a healthcare provider and 27% to discontinue chronic sedative-hypnotic use within 6 months.[7] Likewise, greater public awareness of antibiotic overuse correlates with a reduction in patient expectations for antibiotics and a lower rate of antibiotic prescribing in some studies.[8–11] These examples suggest that increasing patient awareness of low-value care is an effective strategy for driving conversations between patients and healthcare providers, leading to deprescribing of inappropriate medications.[7,11,12]

Many older adults remain uninformed about medication harms and do not question their prescriptions.[13,14] It is likely that raising awareness of inappropriate medications and the concept of deprescribing will increase engagement of older adults in deprescribing conversations. The effectiveness of strategies aimed at widespread empowerment of older adults requires a population-level baseline assessment of their knowledge of medication harms and familiarity with the term "deprescribing." Data gathered through these assessments are essential for designing and evaluating awareness campaigns that equip older adults with the necessary information to engage in deprescribing conversations with healthcare professionals.

The primary objective of this study was to determine older adults' awareness of the concept of medication-induced harm and their familiarity with the term "deprescribing." Secondary objectives were to ascertain determinants of patient-initiated deprescribing conversations and to identify how older adults seek information on medication harms.

METHODS

Study Design, Participants and Setting

This is a cross-sectional population-based household telephone survey. The sampling frame consisted of all listed household telephones numbers in Canada. Households were called at random according to a quota-based stratified sampling framework. The quota target was 200 respondents for each of Canada's 10 provinces and three territories. Long-term care residences were excluded. Eligible respondents were community-dwelling men and women aged 65 and older who spoke English or French and consented to participate. Nonrespondents were defined as those who refused to participate, had a language barrier, or were incapable of answering the survey questions. Unresolved telephone numbers were defined as a busy line, no answer, or an answering machine. Unresolved numbers were added back into the sampling frame until the target quotas were met.

Data Collection

The survey was conducted between August and October 2016 using computer aided telephone interviewing software and random-digit dialling. Employment of bilingual staff ensured that the survey could be administered in English or French. Completion of the survey took on average 7 minutes.

Survey Design

The "perceived severity" and "perceived susceptibility" components of the Health Belief Model of behavior change underpinned the development of the survey.[15–17] This model theorizes that a behavior will occur if a perceived threat (severity and susceptibility) is high, and perceived benefits outweigh barriers. Data from the EMPOWER study show that acquisition of new knowledge about the risks of medication-related harms motivates and triggers older adults to engage in deprescribing conversations.[7,14,18] The questions in the current survey were therefore designed to determine the proportion of older adults with knowledge of medication harms and to assess the extent to which this knowledge is associated with initiation of a deprescribing conversation. Additionally, questions were developed to identify the sources of information that older adults use to acquire information about medication harms to determine potential barriers and optimize access to this information.[19,20] An expert panel with clinical and research experience in geriatrics and deprescribing, consisting of specialist physicians, nurses, pharmacists, allied health professionals, and health researchers, reviewed the content validity of the survey questions. To ensure that medical terminology was written at a level that could be easily understood by community dwelling seniors, and to ensure that the survey had face validity when conducted with older adults, a convenience sample of older adults reviewed the survey questions and iteratively improved the readability. A final check of face validity, readability, and consistent messaging in French and English was made using a bilingual pilot telephone survey of a random sample of 55 older adults across Canada.

Questions were asked about age, sex, number of prescription medications (0, 1–4, 5–9, ≥10); awareness of the term "deprescribing," past history of initiating a conversation with a healthcare professional about stopping a medication (initiating a deprescribing conversation), knowledge of harmful effects of medications, information-seeking behavior in relation to medication harms, and patterns of information-seeking about medication side effects. In accordance with a national strategy to reduce the use of inappropriate prescriptions, the survey included additional questions about use and awareness of harms relating to three targeted drug classes, which were chosen as quality indicators of inappropriateness: sedative-hypnotics, glyburide, and proton pump inhibitors (PPIs).[21] The survey is available upon request.

Sample Size Calculation

We calculated that a sample size of 2,401 older adults was needed to provide a pan-Canadian population estimate of the awareness of the term "deprescribing" with 95% confidence and a 2% margin of error. Canada comprises unique healthcare jurisdictions across 10 provinces and three territories. The prevalence of people

aged 65 and older varies from 3.7% in Nunavut to 19% in New Brunswick.[22] For comparison of healthcare jurisdictions, 188 older adults were required per province and territory to provide a margin of error of 6% with a 90% confidence interval (CI) for a 50% response distribution.

Statistical Analysis

Data were analyzed using descriptive statistics with 95% CIs. Statistically significant associations between two categorical variables were calculated using chi-square tests. Univariate and multivariate associations were determined using logistic regression. Parameters that were associated with an exposure and significant (at $P < .10$) in univariate analysis were included as potential confounders in adjusted analyses. To provide an accurate representation of the Canadian population as a whole, results were weighted to account for variations in population size between healthcare jurisdictions. SPSS version 22 (IBM Corp., Armonk, NY) was used.

Ethical Considerations

Participation in the survey was voluntary, and agreement to answer the telephone questions was taken as consent to participate. No identifying information was collected. The Research Ethics Board at the Institut Universitaire de Gériatrie de Montréal approved the study (approval 15–16–34).

RESULTS

Respondent Characteristics and Medication Use

Of 64,043 household calls attempted, there were 12,156 invalid numbers and 16,659 respondents (26%). Of the 16,659 respondents, 2,665 met eligibility criteria and agreed to complete the survey (16%).

The mean age of respondents was 74.9±7.2 (range 65–100), 66.3% (95% CI = 64.4–68.1%) were female, 23.8% (95% CI = 22.3–25.3) completed the survey in French, 88.3% (95% CI = 87.1–89.6%) had consumed at least one prescription medication during the previous 12 months, and 41.6% (95% CI = 39.7–43.4%) had consumed a sedative-hypnotic, glyburide, or a PPI, with prevalence varying according to each jurisdiction (Supplemental Table S1). Female respondents were more likely than male to have consumed a prescription medication within the previous year (OR = 1.48, 95% CI = 1.16–1.88) and to have consumed a sedative-hypnotic (OR = 1.48, 95% CI = 1.18–1.85) or a PPI (OR = 1.83, 95% CI = 1.51–2.22), although no difference was observed for glyburide (OR = 0.67, 95% CI = 0.44–1.02). Older age (≥80) was directly associated with sedative hypnotic use and inversely associated with PPI use (Table 1). Sedative-hypnotic medication use was more prevalent in French-speaking respondents (OR = 1.36, 95% CI = 1.09–1.70).

Likelihood of Initiating Conversations About Deprescribing

Approximately two-thirds (65.2%, 95% CI = 63.4–67.0%) of respondents were aware that some prescription medications could be harmful (Table 2), and 41.8%, 95% CI = 39.8–43.7%) had initiated a deprescribing conversation with a healthcare provider, with the prevalence varying significantly according to province and territory (Supplemental Table S2). Women and individuals younger than 80 were more likely to initiate deprescribing conversations. Awareness of medication harms raised the likelihood of initiating a deprescribing conversation with a healthcare professional (OR = 1.74, 95% CI = 1.46–2.07), independent of medication class and sex (Table 3).

Table 1. Respondent Characteristics Associated with Prevalence of Use of Potentially Inappropriate Medications

	Use of a Sedative-Hypnotic		Use of Glyburide		Use of Proton Pump Inhibitor		Total
Characteristic	% (95% CI)	*P*-Value for Difference	% (95% CI)	*P*-Value for Difference	% (95% CI)	*P*-Value for Difference	% (95% CI)
Age[a]							
65–79 (n = 1,890)	16.0 (14.4–17.7)	.002	3.8 (3.0–4.7)	.18	28.1 (26.1–30.2)	.03	72.7 (70.8–74.6)
≥80 (n = 710)	21.5 (18.4–24.5)		2.7 (1.5–3.9)		23.8 (20.6–26.9)		27.3 (25.7–28.9)
Sex							
Male (n = 898)	14.1 (11.8–16.4)	.001	4.4 (3.1–5.8)	.08	19.6 (16.9–22.2)	<.001	33.7 (32.1–35.4)
Female (n = 1,767)	19.5 (17.6–21.4)		3.0 (2.2–3.8)		30.8 (28.6–33.0)		66.3 (64.4–68.1)
Language							
English (n = 2,031)	16.5 (14.9–18.2)	.007	2.4 (1.7–3.0)	<.001	26.4 (24.5–28.4)	.25	76.2 (74.3–78.1)
French (n = 634)	21.2 (18.0–24.4)		7.2 (5.1–9.2)		28.8 (25.3–32.4)		23.8 (22.3–25.3)
Number of medications[a]							
0 (n = 114)	11.8 (5.9–17.8)	<.001	0.0 (0.0–0.0)	<.001	3.9 (0.4–7.5)	<.001	4.9 (4.1–5.8)
1–4 (n = 1,252)	16.4 (14.3–18.4)		0.9 (0.4–1.4)		29.2 (26.7–31.8)		54.0 (52.1–56.0)
5–9 (n = 692)	26.9 (23.6–30.2)		7.4 (5.4–9.4)		34.2 (30.7–37.7)		29.9 (28.2–31.6)
≥10 (n = 258)	21.8 (16.7–26.8)		12.1 (8.1–16.2)		39.7 (33.6–45.9)		11.2 (9.9–12.4)
Total (N = 2,665)	17.6 (16.2–19.1)		3.5 (2.8–4.2)		27.0 (25.3–28.7)		100.0 (100.0–100.0)

[a]Total does not equal 2,665 because some respondents declined to answer some questions.
CI = confidence interval.

Table 2. Respondent Characteristics Associated with Awareness and Actions Related to Medication Harms and Deprescribing

Characteristic	Aware of Harmful Medications		Aware of Deprescribing		Initiated a Deprescribing Conversation		Information-Seeking on Medication Harms	
	% (95% CI)	*P*-Value for Difference	% (95% CI)	*P* -Value for Difference	% (95% CI)	*P* -Value for Difference	% (95% CI)	*P*-Value for Difference
Age[a]								
65–79 (n = 1,890)	66.2 (64.1–68.4)	.15	7.2 (6.1–8.4)	.09	43.9 (41.6–46.2)	.003	52.6 (50.3–54.9)	<.001
≥80 (n = 710)	63.1 (59.5–66.8)		5.3 (3.6–6.9)		37.3 (33.7–41.0)		36.8 (33.2–40.3)	
Sex								
Male (n = 898)	60.0 (56.8–63.2)	<.001	8.0 (6.2–9.8)	.11	34.7 (31.4–37.9)	<.001	43.3 (40.0–46.5)	<.001
Female (n = 1,767)	67.9 (65.7–70.1)		6.3 (5.2–7.4)		45.3 (42.9–47.7)		51.2 (48.8–53.5)	
Language								
English (n = 2,031)	72.6 (70.6–74.5)	<.001	7.5 (6.3–8.6)	.02	41.3 (39.0–43.5)	.36	50.9 (48.7–53.1)	<.001
French (n = 634)	42.1 (38.3–46.0)		4.9 (3.2–6.6)		43.4 (39.4–47.4)		40.9 (37.1–44.7)	
Number of medications[a]								
0 (n = 114)	64.8 (56.0–73.7)	.09	7.8 (2.9–12.7)	.47	51.2 (42.0–60.4)	.002	60.7 (51.7–69.7)	.06
1–4 (n = 1,252)	65.0 (62.3–67.7)		6.3 (5.0–7.7)		40.2 (37.4–43.0)		48.8 (46.0–51.6)	
5–9 (n = 692)	67.1 (63.6–70.7)		8.1 (6.0–10.1)		47.8 (44.0–51.6)		50.9 (47.2–54.6)	
≥10 (n = 258)	58.2 (52.2–64.2)		6.3 (3.3–9.2)		48.6 (42.1–55.1)		46.1 (40.0–52.2)	
Total (N = 2,665)	65.2 (63.4–67.0)		6.9 (5.9–7.8)		41.8 (39.8–43.7)		48.5 (46.6–50.4)	

[a]Total does not equal 2,665 because some respondents declined to answer some questions.
CI = confidence interval.

Table 3. Predictors of Initiating a Deprescribing Conversation with a Healthcare Professional

Predictor	Unadjusted	Adjusted
	Odds Ratio (95% Confidence Interval)	
Awareness of medication-induced harms (n = 1696)	1.74 (1.46–2.07)	1.70 (1.43–2.02)[a]
Awareness of the term "deprescribing" (n = 182)	1.50 (1.10–2.04)	1.55 (1.13–2.12)[b]
Information-seeking on medication harms (n = 1284)	4.65 (3.91–5.52)	4.57 (3.84–5.45)[a,b]
Uses the Internet as a source of information about medication harms (n = 707)	2.95 (2.45–3.54)	2.97 (2.46–3.59)[b]
Of individuals aware of medication-induced harms		
Awareness that proton pump inhibitors can cause harm (n = 988)	1.86 (1.50–2.29)	1.75 (1.40–2.20)[a]
Awareness that glyburide can cause harm (n = 230)	1.20 (0.89–1.60)	1.14 (0.85–1.54)[a,b]
Awareness that sedative-hypnotics can cause harm (n = 569)	1.54 (1.26–1.90)	1.49 (1.21–1.84)[a]

[a]Adjusted for sex.
[b]Adjusted for age as a dichotomous variable (65–79, ≥80).

Only 6.9% of respondents (95% CI = 5.9–7.8%) were familiar with the term "deprescribing." French-speaking respondents were less likely to be aware of the potential for medication-related harms (OR = 0.28, 95% CI = 0.23–0.33) and were less familiar with the term "deprescribing" (OR = 0.64, 95% CI = 0.43–0.95) than English-speaking respondents. Awareness of the term "deprescribing" was associated with greater likelihood of initiating a deprescribing conversation with a healthcare professional (adjusted OR (aOR) = 1.55, 95% CI = 1.13–2.12, adjusted for age).

Source of Information About Medication Harms

Forty-eight percent (95% CI = 46–50%) of respondents reported searching for information about medication harms (Table 2, Supplemental Table S3). Individuals who researched medication-related harms were four times as likely to initiate deprescribing conversations (aOR = 4.57, 95% CI = 3.84–5.45) (Table 3). The most-common source of information was the Internet; individuals who sought information about medication-related harms on the Internet were 3 times as likely to initiate a deprescribing conversation (aOR = 2.97, 95% CI = 2.46–3.59). Of those who actively sought information about sedative-hypnotics, glyburide, or PPIs, approximately half considered dose reduction, discontinuation, or substitution (Supplemental Table S3).

DISCUSSION

Two-thirds of Canadian community-dwelling older adults are aware that some prescriptions can cause harm, half of them research information about medication harms, and only 6.9% are familiar with the term "deprescribing." Awareness of medication harms, actively searching for information on medication harms, and knowledge of the term "deprescribing" are positively associated with

initiating a deprescribing conversation; 41.8% of older adults surveyed in this study reported discussing deprescribing with a healthcare provider, although this prevalence is lower than the 50.8% of community-dwelling older adults and 89% of hospitalized older adults who would like to reduce the number of medications they take.[4,23] Approximately three-quarters of community-dwelling older adults are willing to cease one of their medications if their doctor says it is possible, with 51.2% and 42.6% in favor of their pharmacist or nurse leading the deprescribing process, respectively.[4] Integrating the term "deprescribing" into common vernacular may increase the acceptability and frequency of deprescribing conversations between patients and healthcare providers.

The findings from this national survey of older adults are consistent with previous research demonstrating a link between public awareness of medication harms and reduction of inappropriate medication use.[7–12] The magnitude of association is substantial; respondents who actively seek information relating to medication harms are four times as likely to initiate deprescribing conversations, and half consider medication cessation, dose reduction, or substitution. Even in a large, heterogeneous population of older adults, use of the Internet to seek out information about medication harms nearly triples the likelihood of initiating a deprescribing conversation. Despite earlier reports that Internet-based education produces limited effects,[24] possibly because of the poor quality of the information available,[25] more-recent research incorporating theoretical behavior change techniques demonstrates that Internet-delivered educational interventions are effective at changing health behavior.[26] Healthcare providers and organizations tasked with a mandate to improve quality use of medications might consider investing in freely available, theory-based Internet education to increase awareness of inappropriate prescriptions, medication-induced harm, and deprescribing. Attention will need to be paid to patient concerns about privacy and credibility of the source of the information.[27]

Major strengths of this study include the representation of older adults across all Canadian provinces and territories and the large sample size. There are several limitations. The first is the possibility of respondent bias. Only 16% of respondents agreed to complete the survey, with nonresponders expressing disinterest or a language barrier. The effect of respondent bias is likely overestimation of the proportion of older adults who are aware of medication harms and deprescribing, because concern about medication harms may have motivated participation in the study.[28] As with any survey, there is also the possibility of social desirability bias, by which participants provide the responses they think the researchers want to hear, as opposed to answering honestly.[28] The survey questions were cross-sectional in nature so no causal relationships between associations can be established. Finally, the term "harmful medication" may be a vague reflection of the medical term "potentially inappropriate medication." To improve accuracy, multiple terms were piloted, with various groups of older Anglophone and Francophone Canadian adults choosing "harmful medications" (translated as "effets néfastes des médicaments") unanimously as the preferred term. A detailed explanation was provided for respondents requiring clarification. Despite the questionnaire being provided in French and English, there are populations within Canada who do not speak either of these languages, resulting in many nonresponses and an inability to meet the target sample size in the territory of Nunavut. The Canadian population is similar but differs from those of other countries in its high prevalence of French-speaking individuals and lower prevalence of black and Hispanic populations than in the United States.

In conclusion, despite increasing attention being paid to deprescribing in academic circles, few older adults are familiar with the term. Healthcare providers have an important role to play in empowering older adults with information about medication harms to trigger safer medication management. For older adults, the Internet may be an important vector for promoting awareness about the quality use of medicines and improving awareness and culture regarding deprescribing.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Table S1. Prevalence of inappropriate medication use per province (unweighted)

Table S2. Provincial variation in respondent awareness and behaviours towards medication harms and deprescribing (unweighted)

Table S3. Information seeking behaviours

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