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Self-monitoring of blood glucose (SMBG) is an activity performed by most diabetes patients as part of their overall management strategy. As blood glucose strips are purchased from pharmacies, pharmacists are in an ideal position to educate patients on the prudent use of these strips. We aimed to test the feasibility of pharmacists educating new meter users about how the Canadian Diabetes Association recommends SMBG be performed and the resulting effects.

L'auto-surveillance de la glycémie (ASG) est une activité qu'effectuent la plupart des patients diabétiques dans le cadre de leur stratégie générale de prise en charge. Les bandelettes de glycémie étant achetées en pharmacie, les pharmaciens sont les mieux placés pour enseigner aux patients comment utiliser ces bandelettes prudemment. Notre but était d'évaluer si les pharmaciens pouvaient enseigner aux nouveaux utilisateurs d'un indicateur de glycémie comment effectuer l'auto-surveillance selon les recommandations de l'Association canadienne du diabète et comment en gérer les résultats.

The association between self-monitoring of blood glucose, hemoglobin A1C and testing patterns in community pharmacies: Results of a pilot study

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ABSTRACT

Objectives: To determine if pharmacists providing advice on self-monitoring of blood glucose (SMBG) to new meter users, based on the Canadian Diabetes Association (CDA) Clinical Practice Guidelines (CPGs), resulted in improvements in A1C. SMBG testing patterns and pharmacist interactions were also observed.

Methods: A cluster randomized, pilot study was performed, with pharmacies randomized to an intervention or control group. The intervention group provided SMBG education according to the CDA CPGs at baseline, 2 weeks, 1 month and 3 months; the control group provided usual care. The primary endpoint was the mean change in A1C measured at 6 months. Secondary endpoints included a description of SMBG patterns and lifestyle changes and were determined via a self-administered questionnaire.

Results: Thirty-six participants (26 intervention, 10 control) were recruited from 9 pharmacies across Saskatchewan, Canada. Mean A1C decreased by -1.69 and -0.70 in the intervention and control groups, respectively ($p = 0.376$). A total of 12 of 26 (46.2%) participants in the intervention group indicated they performed SMBG ≥ 7 times per week; 75% (9/12) of these were controlled by lifestyle or metformin alone. When applicable, most participants in the intervention group indicated they perform SMBG with exercise (62.5%), during illness (62.5%) and with hypoglycemic symptoms (81.3%) compared with 33.3%, 42.9% and 42.9% in the control group, respectively. Most participants in the intervention group (20/26; 76.9%) reported making lifestyle changes as a result of speaking with the pharmacist, with all indicating that they maintained these changes at 6 months.

Conclusions: The results of this pilot study indicate that a larger study examining pharmacist interventions related to SMBG is feasible. Future studies are required to determine patient motivations and further evaluate the role of pharmacists in ensuring best practices to positively influence guideline-based blood glucose monitoring. *Can Pharm J (Ott)* 2016;149:28-37.

Introduction

Self-monitoring of blood glucose (SMBG) provides immediate feedback regarding a person's glycemic level at any given point in time and is considered a cornerstone of diabetes management. SMBG can be a useful educational tool during and after a diabetes diagnosis, as it provides patients with a means of monitoring glycemic control resulting from lifestyle management and pharmacological therapies.¹

In 2013, the Canadian Diabetes Association (CDA) published updated clinical practice guidelines that included changes regarding the practice of SMBG. Although an individualized approach is favoured, recommendations were made based on whether patients were managed with insulin, antihyperglycemic agents or lifestyle alone and included specific situations such as in times of illness, introduction of a new medication known to affect blood glucose, or if experiencing symptoms of hypoglycemia. These recommendations are similar to what the Canadian Optimal Medication Prescribing and Utilization Service (COMPUS) committee recommended in 2009.² Recommendations regarding the utility of SMBG for insulinized patients are clear; however, the optimal timing and frequency for noninsulinized patients are still uncertain.^{1,3-5}

SMBG test strips have a significant budgetary impact on both public and private health plans. It is estimated that up to \$500 million is spent on SMBG test strips per year in Canada,⁶ and they are the third highest expenditure for insurable pharmacy-dispensed products in some jurisdictions.⁷ All Canadian provinces offer some level of public coverage for SMBG test strips for type 1 diabetes patients, with the majority offering coverage for type 2 patients as well. However, many provincial jurisdictions, along with the Non-Insured Health Benefits program (which covers prescription costs for eligible First Nations people and Inuit), have set up blood glucose test strip reimbursement caps based on specific criteria.⁸⁻¹⁰

Traditionally, blood glucose monitors are initially received from a community pharmacy, putting pharmacists in an ideal position to educate patients newly diagnosed with diabetes on the utility of SMBG. Numerous studies have demonstrated that pharmacist interventions in diabetes management can result in improved glycemic control and reduced health care costs.¹¹⁻

¹³ One small ($n = 19$) study demonstrated that

KNOWLEDGE INTO PRACTICE

- New self-monitoring of blood glucose (SMBG) meter starts by the pharmacist may be seen as an opportunity to initiate a comprehensive counselling plan with diabetes patients.
- Although conclusions cannot be drawn from this pilot study, interesting results were observed among intervention and control group pharmacists with respect to A1C and SMBG behaviours, which reinforce the feasibility and importance of a larger study.
- With minimal design adjustments and addressing recruitment issues, this study could be easily replicated in a larger participant population to verify results of this pilot study.

pharmacists can affect how often people monitor their blood sugar;¹⁴ however, little is known as to whether or not pharmacists educating newly diagnosed diabetes patients on SMBG can have any effect on glycemic control or testing patterns. The primary objective of this study was to determine if pharmacists educating patients on SMBG, based on the 2013 CDA recommendations, led to improved hemoglobin A1C.

Methods

An email was sent to all individual pharmacists ($n = 1732$) and a fax to all community pharmacies ($n = 382$) in the province of Saskatchewan, Canada, with a brief description of the study. Those pharmacists interested in participating in the study were asked to contact the study investigator for further information. Pharmacies were eligible for inclusion if they believed they would be able to recruit patients who were initiating SMBG for the first time. Eligible patients included anyone who had a diagnosis of diabetes or prediabetes, was receiving a blood glucose meter for the first time and was willing to provide informed consent.

This study used a cluster randomized trial design, where pharmacies were randomized into either the intervention or control group, using a 2:1 ratio. Randomization was performed using a random number table. Because of the nature of the intervention, blinding of the pharmacists and patients was not possible. However, the data analyst was blinded to treatment allocations. An a priori sample size calculation concluded that 12 pharmacies, each with 10 patients, would be required to determine a difference of 0.64% in A1C measurements with 80% power at a

MISE EN PRATIQUE DES CONNAISSANCES

- Lorsque le pharmacien amorce un nouvel indicateur d'ASG, il peut mettre au point un plan de counseling complet avec les patients diabétiques.
- Bien que cet essai pilote n'ait pas permis de tirer de conclusions, des résultats révélateurs ont été observés parmi les pharmaciens intervenants et le groupe témoin de pharmaciens en ce qui concerne les comportements relatifs à l'A1C et l'ASG, ce qui renforce la faisabilité et l'importance d'effectuer une étude à plus grande échelle.
- En apportant des modifications mineures à la conception et en réglant certains problèmes de recrutement, cette étude pourrait aisément être reproduite auprès d'un plus grand nombre de participants afin de vérifier les résultats de l'essai pilote.

$p < 0.05$. The US Food and Drug Administration (FDA) and the National Institute for Clinical Excellence (NICE) state that A1C reductions of 0.5% to 0.7% are clinically significant.¹⁵ Given previous experience, it was determined that this number would not be obtainable during the study period, so the study was instead conducted as an exploratory pilot to determine the feasibility of the study design and intervention.

Intervention group

Pharmacies that were randomized to the intervention group were asked to send a contact pharmacist to a 1-day training event in Saskatoon, Saskatchewan. These pharmacists were

provided education on SMBG, the recent CDA recommendations and the study glucose meter (BGStar; Sanofi, Laval, Quebec, Canada). They were asked to advise patients to perform SMBG according to the 2013 CDA recommendations¹ and were given a health care provider tool published by the CDA (Table 1 and Table 2).¹⁶

At the time of first receiving their SMBG meter (free of charge), participants were educated on how to perform SMBG, when to perform SMBG and how to interpret results. All participants had their baseline A1C measured with the A1CNow+ (Bayer Healthcare LLC, Sunnyvale, CA) point-of-care device in a private location in the pharmacy.¹⁷ All participants were also informed of the online and in-person StarSystem resources available to them with the use of their BGStar meter. Participants were contacted by telephone by the study pharmacist 2 weeks after receiving their meter and again at 1 month and 3 months to see if they had any questions related to their diabetes or SMBG. At 6 months, participants were asked to return to the pharmacy, at which point they had their A1C measured with the same A1CNow+ point-of-care device and were asked to fill out a questionnaire on the frequency and timing of their SMBG.

Control group

Pharmacies that were randomized to the control group were not given any specific information on what to tell people with respect to SMBG.

TABLE 1 Canadian Diabetes Association 2013 recommendations for situations where regular SMBG is required¹⁶

Situation	SMBG recommendation
Using multiple daily injections of insulin (≥ 4 times per day)	SMBG ≥ 4 times per day
Using an insulin pump	
Using insulin < 4 times per day	SMBG at least as often as insulin is being given
Pregnant (or planning a pregnancy), whether using insulin or not	SMBG individualized and may involve SMBG ≥ 4 times per day
Hospitalized or acutely ill	
Starting a new medication known to cause hyperglycemia (e.g., steroids)	SMBG individualized and may involve SMBG ≥ 2 times per day
Experiencing an illness known to cause hyperglycemia (e.g., infection)	

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TABLE 2 Canadian Diabetes Association 2013 recommendations for situations where increased frequency of SMBG may be required¹⁶

Situation	SMBG recommendation
Using drugs known to cause hypoglycemia (e.g., sulfonylureas, meglitinides)	SMBG at times when symptoms of hypoglycemia occur or at times when hypoglycemia has previously occurred
Has an occupation that requires strict avoidance of hypoglycemia	SMBG as often as is required by employer
Not meeting glycemic targets	SMBG ≥ 2 times per day, to assist in lifestyle and/or medication changes until such time as glycemic targets are met
Newly diagnosed with diabetes (<6 months)	SMBG ≥ 1 time per day (at different times of day) to learn the effects of various meals, exercise and/or medications on blood glucose
Treated with lifestyle and oral agents AND is meeting glycemic targets	Some people with diabetes might benefit from very infrequent checking (SMBG once or twice per week) to ensure that glycemic targets are being met between A1C tests

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Instead, they were instructed to provide their usual standard of care. Upon enrollment, the pharmacist distributed the BGStar meter (free of charge), measured the participant's A1C and then performed the usual care for dispensing a blood glucose meter for the first time. All participants had a repeat A1C measurement at 6 months and completed a questionnaire.

Outcomes

The primary outcome was the mean change in A1C at 6 months from baseline. Secondary outcomes were measured using the questionnaire and included the self-reported frequency and timing of blood glucose monitoring and lifestyle changes adopted. A validated questionnaire did not exist for the purposes of this study, so one was developed. The questionnaire was tested on a group of pharmacy students and nonpharmacists prior to its final version. The self-administered questionnaire consisted of 33 questions over 4 sections, depending on how the patients responded. Questions were primarily closed-ended questions, with a few opportunities for open-ended input. A copy of the questionnaire is available upon request. The questionnaire was distributed to patients at study completion (6 months) and mailed directly to the study investigators. Participants were provided a small honorarium for returning a completed questionnaire.

Analysis

Basic descriptive statistics were performed and all data were analyzed using SPSS v.22 (SPSS, Inc., an IBM Company, Chicago, IL). Baseline characteristics between the 2 groups were compared using both cluster and individual-level variables and using independent *t* tests and χ^2 , as appropriate. The mean change in A1C at study end was compared between groups using analysis of covariance (ANCOVA), adjusting for baseline A1C levels. All analyses were conducted using intention to treat, with the last observation carried forward for any missing data. The study protocol was approved by the University of Saskatchewan Biomedical Research Ethics Board, and all participants provided informed signed consent before enrollment.

Results

A total of 20 pharmacies responded to the advertisement, and of these, 12 indicated their ability to recruit new SMBG users. In total, 36 participants were recruited from 9 pharmacies over a 6-month period; 3 pharmacies did not recruit any participants.

The 9 pharmacies were located throughout the province of Saskatchewan, with a mix of urban and rural centres and practice settings. Twenty-six participants were recruited from 7 intervention sites and 10 participants were recruited from 2 control sites. The mean (SD) age of participants

TABLE 3 Baseline characteristics of study pharmacies and participants

	Intervention (n = 26)	Control (n = 10)
Age, mean (SD), y	61 (11.8)	65.2 (11.8)
Male, n (%)	16 (61.5)	3 (30)
Female, n (%)	10 (38.5)	7 (70)
Diabetes type, n (%)		
Type 1 diabetes mellitus	1 (3.9)	0 (0)
Type 2 diabetes mellitus	18 (69.2)	3 (30)
Prediabetes	7 (26.9)	7 (70)
Setting, n (%)		
Urban*	5 (19.2)	0 (0)
Rural†	21 (80.8)	10 (100)
Type of pharmacy, n (%)		
Independent	5 (19.2)	7 (70)
Grocery	15 (57.7)	2 (20)
Chain	6 (23.1)	1 (10)

*Urban pharmacy = located in Saskatoon or Regina, Saskatchewan.

†Rural pharmacy = any pharmacy located in Saskatchewan outside of Saskatoon or Regina.

was 61 (11.8) years and 65.2 (11.8) years in the intervention and control groups, respectively. The age range for all participants was 35 to 82 years. Participants in the intervention groups were primarily male and had type 2 diabetes, whereas those in the control group were primarily female and had prediabetes (Table 3).

All of the participants had their A1C measured at baseline, and 35 of 36 (97.3%) had a follow-up A1C performed at 6 months. At baseline, the mean (SD) A1C was 8.44 (2.52) in the intervention group and 7.11 (1.01) in the control group, and at 6 months, the mean (SD) A1C was 6.75 (0.92) and 6.41 (0.56), respectively. The primary outcome of mean reduction in A1C was not statistically significant between the intervention and control group (−1.69 and −0.70, respectively; $p = 0.376$).

All 36 participants completed and returned the questionnaire at study end. There was a wide mix of diabetes medication use reported in the intervention group, with most participants indicating they were taking metformin alone (10/26; 38.5%), followed by 34.6% (9/26) controlled by lifestyle alone and 7.7% (2/26) on a metformin/sulfonylurea combination. One participant each indicated that they were on one of the following combinations: metformin/sulfonylurea/dipeptidyl peptidase-4 (DPP-4) inhibitor, metformin/insulin, sulfonylurea alone, insulin alone or metformin/insulin/meglitinide. The majority of participants

in the control group reported being on no diabetes medications (8/10; 80%) at study end, whereas 2/10 (20%) reported being on metformin alone.

Participants were asked how frequently and when they performed SMBG (Table 4). Of participants in the intervention arm, 46.2% (12/26) indicated they performed SMBG 7 times per week or more, of whom 33.3% (4/12) were not on any diabetes medications, 41.7% (5/12) were on metformin alone and 8.3% (1/12) were on insulin alone, insulin in combination with metformin and a meglitinide (dual therapy), or metformin with a sulfonylurea and DPP-4 inhibitor. The mean A1C of all patients in both arms performing SMBG 7 or more times per week was 6.7%; only 20% (3/15) had an A1C greater than 7%. Three (30%) participants in the control group indicated they performed SMBG at least 7 times per week (2 were not on any diabetes medications and 1 did not answer), 4 (40%) participants indicated they performed SMBG 1 to 6 times per week and 3 (30%) indicated they checked their sugars less than once a week.

A slightly higher percentage of patients in the intervention group (22/26; 84.6%) than the control group (7/10; 70%) indicated that they performed a mixture of both pre- and postmeal SMBG, and a slightly lower percentage (4/26; 15.4% vs. 3/10; 30%) indicated they only performed SMBG during fasting (first thing in the

TABLE 4 Frequency and timing of SMBG and providers of advice

	Intervention (n = 26)	Control (n = 10)
Frequency of SMBG, n (%)		
≥7 times per week	12 (46.2)	3 (30)
1-6 times per week	13 (50)	4 (40)
<1 time per week	1 (3.8)	3(30)
When SMBG is performed, n (%)		
Mix of before and after meals	22 (84.6)	7 (70)
Only in fasting periods	4 (15.4)	3 (30)
Providers of SMBG advice, n (%)		
Pharmacist	21 (80.8)	9 (90)
Physician	13 (50)	4 (40)
Nurse	7 (26.9)	1 (10)
Dietitian	13 (50)	2 (20)

SMBG, self-monitoring of blood glucose.

morning, before meals or at bedtime). Pharmacists were the health care professionals who most often provided advice on SMBG in both the intervention (21/26; 80.8%) and control arms (9/10; 90%), followed by physicians (13/26; 50% and 4/10; 40%, respectively). Of all participants who received advice from more than one health care professional, the majority (13/24; 54.1%) primarily followed the advice of the pharmacist, followed by the physician (4/24; 16.7%) and combinations of pharmacists and other health care practitioners (4/24; 16.7%) (Table 4).

Participants were also asked if they ever checked their blood sugar before or after exercise, when they were ill and when they exhibited signs and symptoms of hypoglycemia (lightheadedness, shakiness or sweating). In general, participants in the intervention group indicated they performed SMBG more often in these situations than those in the control group (Table 5).

When asked how many times they had spoken to the pharmacist about their blood sugars over the past 6 months, the majority of participants (10/26; 38.5%) in the intervention group indicated 5 to 7 times, followed by 2 to 4 times (5/26; 19.2%). Three participants (3.8%) each stated they had spoken to the pharmacist about their blood sugars once, 8 to 10 times and more than 10 times, while 2 participants (7.7%) indicated never. One (10%) participant in the control group indicated she spoke to her pharmacist about her blood sugars 1 time, 8 (80%) participants indicated 2 to 4 times and 1 (10%) participant indicated 5 to 7 times.

Participants were asked if they had made any behavioural changes as a result of talking to their pharmacist about their diabetes, and 76.9% (20/26) and 60% (6/10) of the participants in the intervention and control arms, respectively, reported that they had. Of the intervention participants who indicated they had made changes, 95% (19/20) indicated they started eating better and 35% (7/20) reported they increased the amount they exercised. All of the participants in the intervention group indicated that they were maintaining these changes at the end of the study. All patients in the control group (6/6, 100%) who reported making changes expressed that they had started eating better, whereas only 1 participant indicated that he or she also increased the amount exercised. Of these, 4 of 6 (66.7%) reported that they maintained these changes at the end of the study.

Discussion

In this pilot study of a pharmacist-initiated SMBG program, we were able to demonstrate the feasibility of training pharmacists about the CDA CPG recommendations and enrolment of patients. However, statistically significant differences in A1C were not observed for the primary outcome between treatment groups (−1.69 [19.96%] intervention arm and −0.70 [9.85%] control arm). This could be attributed to a number of factors, such as the small sample size, disproportionate sample and medication usage.

The accessibility of pharmacists as health care providers has been well documented¹⁸⁻²⁰ and is

TABLE 5 SMBG with exercise, illness or hypoglycemic symptoms

	Intervention (n = 26)	Control (n = 10)
Testing with exercise, n (%)		
Yes	10 (38.5)	2 (20)
No	6 (23.1)	4 (40)
Not applicable	8 (30.8)	1 (10)
Did not answer	2 (7.8)	3 (30)
Testing during illness, n (%)		
Yes	8 (30.8)	3 (30)
No	5 (19.2)	4 (40)
Not applicable	10 (38.5)	0 (0)
Did not answer	3 (11.5)	3 (30)
Testing with hypoglycemic symptoms, n (%)		
Yes	13 (50)	3 (30)
No	3 (11.5)	4 (40)
Not applicable	8 (30.8)	0 (0)
Did not answer	2 (7.8)	3 (30)

highlighted in this study. Most patients in the control group indicated they had spoken to their pharmacist about their blood sugar control 2 to 4 times over the 6-month period. Most patients in the intervention group reported speaking about their blood sugar control 5 to 7 times, and a significant number indicated they had spoken to their pharmacist more than 8 times. The majority of participants also indicated they were receiving advice on SMBG from other health care providers, but it was the pharmacist whose advice they were following the most. The apparent trust shown in pharmacists regarding SMBG, coupled with the number of interactions displayed, provides further evidence that pharmacists are ideally situated to help diabetes patients determine when and how to perform SMBG to help reach their goals.

Pharmacists in this study were provided information on the CDA CPG recommendations for SMBG and asked to counsel using these recommendations. Despite this, 34.6% (9/26) of patients in the intervention arm who were not on antihyperglycemic medications or were on metformin monotherapy indicated they were performing SMBG ≥ 7 times per week. Similarly, 30% (3/10) of patients in the control group were testing at least 7 times per week, and 2 of these patients were controlled via lifestyle measures alone. Given these participants' low risk of hypoglycemia and baseline A1C, these particular patients do not need to be testing their blood sugars this

often, as these practices were reported 6 months after being initially instructed to perform SMBG. The majority of patients indicated they were primarily following the pharmacist's advice with respect to SMBG; however, many were receiving information from multiple health care providers. Hence, it is difficult to pinpoint why these participants were performing SMBG more than necessary. How people with diabetes perform SMBG is often multifactorial, and the advice of health care professionals is not always followed.²¹ Certainly, family, friends and Internet advice can all play a major role as well. Revelations from this pilot study can be used in future research to try and determine exactly why patients still proceeded to perform SMBG more than appears necessary, particularly in light of its discomfort and expense.

Both groups appeared to be checking their blood glucose before and after meals. This is important, as postmeal tests are useful from a learning perspective to see how certain foods affect glycemic levels, and postprandial glucose contributes more to overall glycemia than fasting glucose in fairly well-controlled patients.²² Hence, it is plausible that checking blood sugars beyond the traditional "first thing in the morning" practice that many patients engage in could have contributed to the better dietary decisions patients indicated they made as a result of talking to the pharmacist. It is also encouraging that the majority of patients in whom it was applicable indicated that they perform SMBG during times of illness, if

experiencing hypoglycemic symptoms and during exercise, which is consistent with the CDA guidelines.¹ Results showed a greater proportion of patients in the intervention group engaged in this form of SMBG over the control group. Although these results are exploratory and should be interpreted with caution, they are nonetheless interesting and should be pursued in further studies with respect to actual timing of SMBG.

Encouragingly, the majority of patients reported that the pharmacist spoke to them about lifestyle modifications, particularly regarding diet and exercise. Almost all (95%) of the patients in the intervention group reported that they made lifestyle changes as a direct result of talking to their pharmacist and indicated they were maintaining these changes at 6 months. The literature shows that when pharmacists intervene with diabetes patients, clinical and surrogate outcomes improve.²³⁻²⁵ However, pharmacists often have difficulty initiating counselling and education sessions.^{26,27} Based on these findings, meter initiation by the pharmacist may be seen as an opportunity to initiate a comprehensive counselling plan with diabetes patients.

Limitations

A major limitation of this study was the small number of participants recruited (lack of power) and the imbalance between intervention and control patients at baseline. However, the use of ANCOVA for comparing the primary endpoint between groups adjusted for the difference in A1C at baseline. Also, the differences in medication use between the 2 groups could have contributed to the changes in A1C.

Various reasons were provided as barriers to participant recruitment (related to staffing issues and lack of time), which are inherent problems when trying to conduct pharmacy practice research.^{28,29} Also, it was noted by a few study pharmacists that new SMBG meter starts are increasingly occurring more commonly in diabetes centres as opposed to the traditional purchase through a community pharmacy, which may also have contributed to recruitment challenges.

Another major limitation is the small number of pharmacies/pharmacists who chose to participate in this study. There are 382 community pharmacies in Saskatchewan, and pharmacists from only 20 pharmacies responded to our advertisement. Eight of these pharmacies chose not to participate upon learning more about the project, as they felt they would not have the ability to

recruit enough patients given their interactions with new diabetes patients along with staffing issues within the pharmacy. In order for follow-up studies to succeed, investigators may wish to proactively recruit pharmacies known to be actively involved in pharmacy practice research and diabetes management programs.

SMBG is informative in certain situations but can also be expensive, painful and unnecessary in others. The utility of SMBG in patients on insulin therapy is clear but is still an area of significant debate in patients not managed on insulin. From a policy perspective, it is important to pursue mechanisms by which appropriate SMBG can be encouraged, given the large amount of public dollars spent on glucose test strips. Hence, it is imperative that future studies try to discern the motivations behind patients' decisions to perform SMBG and how health care providers can encourage appropriate testing.

Implications of research

This was a small pilot study with only a limited number of participants, and so generalizability is greatly limited. We did learn some valuable information, however; for example, pharmacists who were selected to be in the intervention group were receptive to the CDA recommendations regarding SMBG and further study of integrating these recommendations into practice is feasible. To be able to draw any conclusions about what impact guideline-driven recommendations may have on patient behaviour with respect to SMBG, recruitment methods should focus on identifying pharmacies that are heavily involved in new meter starts.

Conclusion

The results from this small pilot study provide the basis for a larger study to actually determine if pharmacists educating patients based on published guidelines results in more appropriate SMBG and improvements in glycemic control. This will help provide an assessment of the utility of these published guidelines. Given pharmacists' accessibility and the apparent willingness of patients to follow their advice related to SMBG, there is significant opportunity for pharmacists to provide guideline-driven SMBG recommendations. Future studies are required to determine patient motivations and further evaluate the role of pharmacists in ensuring best practices to positively influence guideline-based blood glucose monitoring. ■

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