BMJ Open Improving opioid guideline adherence: evaluation of a multifaceted, theory-informed pilot intervention for family physicians

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ABSTRACT

Objectives Opioid-related deaths continue to increase in North America, an epidemic that was initiated by high rates of opioid prescribing. We designed a multifaceted, theory-informed Opioid Self-Assessment (OSA) package, to increase adherence to the Canadian Opioid Guideline among family physicians. This study aimed to assess changes in Canadian family physicians' knowledge and practices after completing the OSA package.

Design We conducted a mixed-method evaluation using a pre-test and post-test design that involved the collection of both qualitative and quantitative data.

Setting This research was conducted in the primary care setting in Ontario, Canada.

Participants We recruited a purposive sample of nine family physicians in Ontario who use long-term opioid therapy to treat patients with chronic pain.

Interventions The OSA package included four components: an online knowledge test, an online learning programme, a safe medication practice self-assessment questionnaire and chart audit with feedback.

Outcome measures Our measures included changes in knowledge, opioid safety practices and physicians' perspectives on the OSA package.

Results We found statistically significant improvements between pre-test and post-test knowledge scores at both baseline and 6-month follow-up. Physicians' scores improved significantly on five of the seven core characteristics of the practice self-assessment questionnaire. On the chart audits, we observed an improvement in patient education between baseline and 6 months. Qualitative interviews showed that participants appreciated embedded resources in the OSA package. The completion of the package stimulated identification of gaps or deficits in practice and served as a useful reminder to discuss risk and safety with patients. Participants described the chart review as helpful in prompting discussions with their patients, identifying deficits and strengths and a 'primary motivator' for project participation.

Conclusions The OSA package has the potential to improve medication safety practices in primary care related to opioid monitoring and adherence to current opioid guidelines.

Strengths and limitations of this study

- This study is the first to describe a multifaceted theory-based approach to the dynamics related to opioid guideline adherence in Canada using quantitative and qualitative research methods.
- Our results will contribute to advancing the implementation of safer opioid monitoring practices and quality monitoring processes by providing the ingredients of a successful implementation strategy to future implementation efforts.
- We used a pre/post study design without a control group with a small sample size in a single jurisdiction, which may affect the generalisability of the results of this pilot study.
- The completion of the Opioid Self-Assessment package is very time consuming and resource intensive, which limits its uptake by busy prescribers, and implementation by organisations that cannot dedicate a project coordinator.

INTRODUCTION

Over the past 20 years, the rates of opioid use — prescribed and non-prescribed — has increased dramatically in North America.^{1 2} This unprecedented increase in opioid consumption has led to a sharp escalation in the prevalence of opioid-related morbidity and mortality.^{3 4} While the introduction of highly potent synthetic opioids into the illicit opioid market have become the main contributors in opioid-related overdoses, active prescriptions remained involved in approximately one-third of opioid-related deaths in 2016 in Ontario.^{5 6}

The opioid-related overdose crisis is complex, and no single intervention has shown a major impact to reduce opioid-related deaths.⁷ In an attempt to improve patient safety, the Canadian Opioid Guidelines were developed initially in 2010 with new guidelines released in 2017.⁸ Although

there has been a small decrease in rates of prescribing,⁹ reports discussing the impact of various interventions have struggled to correlate the development of the new guidelines and the reductions in population-level overdoses.^{10 11} Nevertheless, interventions, for example audit and feedback, computer decision support systems and multifaceted interventions show more effectiveness for changing prescribing behaviour and may show more effectiveness in reducing opioid prescriptions.¹²

Using implementation science and behaviour change theory,^{13 14} we designed a comprehensive Opioid Self-Assessment (OSA) package to increase adherence to the Canadian Opioid Guideline among family physicians. The OSA package uses practical educational and self-assessment tools to provide prescribers with feedback on their current knowledge and practices, and resources to improve their practice.

This study aims to assess changes in Canadian family physicians' knowledge and practices in safer prescribing and monitoring of opioids after completing the OSA package. In addition, this study discusses the clinicians' perspectives on the opioid guidelines, their implementation, facilitators and barriers and their experience with the OSA package and its impact on their opioid prescribing and monitoring behaviours.

METHODS

Based on the 2010 Canadian Guideline for Safe and Effective Use of Opioids for Non-Cancer Pain,^{15 16} an interdisciplinary team developed a pilot intervention and a mixed-methods evaluation of processes and outcomes. Details of the project protocol have been described previously.¹⁷ Our project included three phases:

1. Developing the intervention (OSA package).
2. Evaluating the intervention.

3. Revising the intervention and preparing for wider implementation.

Developing the intervention (the OSA package)

An interdisciplinary team with expertise in primary care, pain medicine, addiction medicine, medication safety, pharmacy, bioethics, public health, clinical epidemiology and implementation science developed a multifaceted intervention, informed by evidence and rooted in behaviour change theory (the COM-B theory).^{13 14} This approach targets more than one domain of behaviour: capability, motivation and opportunity. A given intervention might change one or more components in the behaviour system, and it has been shown more effective at producing meaningful behaviour change than single-domain interventions.

The team members mapped potential facilitators and barriers for provider-level guideline adherence to a behaviour change framework (the Theoretical Domains Framework, TDF) using a systematic process of mapping.^{13 14 17} The TDF provides a theoretical lens through which to view the cognitive, affective, social and environmental influences on behaviour. Then, the team selected appropriate implementation strategies linked through behaviour change theory (COM-B).

Next, the team drafted four products based on the Canadian Opioid Guideline¹⁶ and the Opioid Manager tool¹⁸ to develop what we called the OSA package. The Opioid Manager is a point of care tool that condenses key elements of the Canadian Opioid Guideline and can be used as a chart insert in paper format, iOS application or installed into Electronic Medical Records. The OSA package is described in detail in our previous publication.¹⁷ The OSA package includes multiple components covering a broad range of knowledge and behaviours related to opioid prescribing and monitoring (table 1). In brief, it included:

Table 1 Opioid self-assessment package

Measurement	Baseline	Comparison	Outcome
Opioid knowledge test	Immediately prior to online SAP	Immediately after online SAP, repeat at 6 months	Knowledge of safe and appropriate opioid prescribing
Online SAP	Completion of 3 hour online SAP	Repeat at 6 months	Satisfaction with online SAP
Practice Self-Assessment Questionnaire	Within 2 weeks prior to online SAP	Within 2 weeks after the online SAP (at 6 months)	Implementation of safety processes in opioid prescribing
Chart review checklist	Charts for most recent five patients initiated on long-term opioids prior to completing the online SAP	Charts for most recent five patients initiated on long-term opioids after the online SAP (at 6 months)	Adherence to guidelines in opioid prescribing and monitoring
Qualitative interviews	Interview part 1 before online SAP, and part 2 within 2 weeks of completing the online SAP, Practice Self-Assessment Questionnaire and receiving the chart review feedback	Interview part 3 after completing the online SAP (at 6 months)	Experiences with guideline, quality improvement processes and the project tools

.SAP, Self-Assessment Programme.

Part 1: opioid knowledge test

The knowledge test was developed with the guidance of an expert in creating examination questions. The knowledge test consists of 10 randomly selected questions from a bank of 30 questions. The test focusses on five sections: (1) assessment prior to opioid therapy, (2) conducting an opioid trial, (3) monitoring therapy, (4) specific populations and (5) managing opioid addiction.¹⁷

Part 2: online opioid self-assessment programme

This accredited 3 hour online programme uses multiple learning methods (didactic slides, opioid guideline review, videos demonstrating interactions with patients, practice questions and case examples) to provide physicians with feedback about their gaps in knowledge, and to create individualised learning plans. The content of the Self-Assessment Programme was primarily based on the 2010 Canadian Opioid Guideline,^{15 16} and used a related practice tool called the 'Opioid Manager' online supplementary appendix A.¹⁸

Part 3: practice self-assessment questionnaire

This is a self-administered questionnaire adapted from other medication safety tools developed by the Institute for Safe Medication Practices Canada.^{19 20} The opioid Practice Self-Assessment Questionnaire takes approximately 2 hours to complete. It includes 70 items across seven core characteristics that influence the safety of opioid use: initial patient assessment, initial treatment plan (including treatment agreement), patient monitoring (including urine drug testing), drug information, communication of prescription, competency and education and patient education. Respondents are asked to evaluate the level of implementation of each item using a 5-point Likert scale from 0='No activity to implement' to 5='Fully implemented throughout' online supplementary appendix B.

Part 4: chart audits with feedback

We developed a chart review checklist as a method of checking the opioid prescribers on their clinical performance. It was adapted from the practice review assessment form that was used by the College of Physicians and Surgeons of Ontario with methadone prescribers.²¹ The chart review extracts data focussing on the diagnosis and assessment of pain, provision of education to the patient and the treatment plan (including the use of opioid, non-opioid and non-pharmacological interventions) and the use of treatment agreements and urine drug screening tests are also listed online supplementary appendix C.

Evaluating the opioid self-assessment package

The evaluation approach used a pre-test and post-test design over a 6-month period, and included mixed quantitative and qualitative data collection (see published protocol¹⁷). Using this design, we sought to understand changes in knowledge, performance and attitudes over time.

Setting

We conducted this study in a general primary care setting in the province of Ontario from March 2016 to March 2017.

Characteristics of participants

For this study, we targeted a purposive sample of family physicians, who were expected to have different perspectives. To fulfil this purpose, we recruited family physicians, who treat patients with long-term opioid therapy (daily opioid use for at least 3 months) for chronic pain (ongoing pain for at least 6 months) in Ontario, in diverse practice settings (eg, academic/community, urban/suburban/rural and individual/team).

Physicians with a focussed practice in chronic pain or addiction, and physicians involved in the peer-review assessment process for the College of Physicians and Surgeons of Ontario were excluded. We recruited both men and women to ensure equal gender representation. Potential participants were contacted by email through our investigators' professional networks, and snowball-sampling techniques through the enrolled participants. Participants were screened by phone by the project manager to ensure the inclusion criteria were met. All participants were compensated for their participation in the study.

Measurements

Procedures

Following written informed consent, we started the baseline assessment. The two reviewers (initially PL and YS, who then trained RR and MP listed in acknowledgements) visited the participating physicians and each independently reviewed five selected patients' charts per physician using the chart review checklist. A copy of the chart review checklist was provided to the physicians for their own reference. Charts for the most recent five patients initiated on long-term opioids were selected. We asked all participants to complete baseline knowledge test and the online Self-Assessment Programme. At the end of the Self-Assessment Programme, participants completed the knowledge test again, as well as the Practice Self-Assessment Questionnaire. All participants were contacted for the first two interviews (at baseline and within 2 weeks after completion of the OSA package). (figure 1)

Follow-up assessment occurred approximately 6 months later. Participants were also asked to complete all the study tools a second time to compare findings with baseline. Another set of selected patients' charts were also reviewed.

A physician within our project team (ADF) who had not been in contact with any of the participants read the chart review results, summarised the findings and created a one page document of comments as feedback for the participants. A second physician from our project team (PL) provided a 30 min telephone feedback discussion with participants on the set of chart reviews. The feedback

Figure 1 Procedures for data collection at baseline and follow-up.

focussed on activities that reflected or partially reflected adherence to the guideline, and activities that were not completed or could be improved.

Semi-structured qualitative interviews

We invited participating physicians to attend three 45 min semi-structured qualitative interviews over the study period using semi-structured interview guides. Interviews were conducted in person when feasible or otherwise by telephone, and all interviews were audio recorded with permission. The first interview focussed on facilitators of and barriers to adherence to the 2010 Canadian Opioid Guideline, attitudes towards using quality improvement processes in clinical practice and clinical experiences relevant to the research objectives. The second interview focussed on physicians' experience with participating in the OSA package. The third interview focussed on physicians' behaviour changes in opioid prescribing. The qualitative interview guide is shown in online supplementary appendix D.

Patient and public involvement

The OSA package was developed by the researchers in consultation with clinicians, regulators and policymakers. The OSA package was presented and discussed at an end-of-project workshop which involved academics, clinicians, regulators, policymakers, government, educators and patients.

Data analyses

Quantitative data analysis

We used basic descriptive statistics to analyse the quantitative data from the online self-assessment programme, chart review checklist and practice self-assessment questionnaire. Descriptive statistics included frequencies, sums, means, medians, cross tabulations, χ^2 , McNemar tests for paired proportions and paired t-tests using PASW Statistics 18 (PASW Statistics for Windows, V.18.0, 2009).

Qualitative data analysis

Semi-structured interviews with nine family physicians in Ontario were conducted by two individuals on the project team (YS and AH). Interviews were conducted in person or by phone, the recordings were transcribed and the data

was managed using the NVivo 10 software. For analysis, we used a qualitative content analysis approach that draws on the tenets of qualitative description²² and the constant-comparative method.²³ A separate researcher with experience in qualitative data analysis read all transcripts and employed a qualitative-descriptive approach in which open coding was used to identify themes in the set of responses. A student familiar with the project's goals also read and coded a subset of the interviews; the two coders' results were compared and disparities discussed in order to achieve consensus. By the second round of coding and comparing, consensus had been reached both in terms of characterising responses and in terms of the centrality of particular themes. The analytical reasoning in qualitative research is inductive rather than deductive, as is common in quantitative approaches. In contrast to purely deductive research in which the researcher attempts to fit the data into previously defined categories, in this qualitative research categories and themes are developed and refined as data are collected, compared and considered.

RESULTS

Demographics

Ten family physicians consented to participate in the study (five men and five women). Nine of them participated in this study, four men and five women, while one physician withdrew before participating in any of the research components (table 2). The average years in practice was 16 years and ranged between 6 to 35 years. Seven participants worked in urban and suburban areas, and two in rural areas. Three physicians worked exclusively in an academic environment. Five received continued medical education (CME) focussing on opioids prior to participating in this study. All of our participating physicians used electronic medical records (EMR). Physicians had an average of 1227 patients (ranged between 450 to 2200 patients per physician) and an average of 102 patients with chronic pain (ranged between 10 to 400 patients per physician). An average of 35 patients were on long-term opioids (ranged between 7 to 120). Collectively these physicians provided primary care to approximately 11 050

Table 2 Demographics of nine physician participants

Characteristics	Data
Male: n (%)	4 (44)
Female: n (%)	5 (56)
Years in practice: mean (range)	16 (6–35)
Urban: n (%)	7 (78)
Rural: n (%)	2 (22)
Academic: n (%)	3 (33)
Electronic medical record: n (%)	9 (100)
Number of physicians in practice: mean (range)	10 (2–30)
Number of patients in practice: mean (range) and total	1227 (450–2200) 11 050
Number of patients with chronic pain: mean (range) and total	102 (10–400) 925
Number of patients on long-term opioids: mean (range) and total	35 (7–120) 315
Proportion of patients with chronic pain who are on long-term opioids: mean (range)	47% (13%–75%)
Previous opioid continuing medical education: n (%)	5 (55)

patients, 925 patients had chronic pain and 315 were on long-term opioid therapy.

Quantitative data

Knowledge improvement

Nine participants answered the **knowledge test** four times: immediately pre- and post- completing the online Self-Assessment Programme (at baseline and at 6 months).

Analysis showed that the mean scores of correct responses improved significantly on completing the online module at baseline pre-test and baseline post-test (51% and 78% respectively, $p=0.02$) and completing after 6 months pre-test and 6 months post-test (72% and 94% respectively, $p=0.03$). It is worthy to note however, there was a non-significant decline between baseline post-test and 6 month pre-test (78% and 72% respectively, $p=0.50$) (figure 2).

As for the **Practice Self-Assessment Questionnaire**, we detected improvement on partial or full implementation for all of the seven core characteristics for safer opioid prescribing (baseline to 6 months). We found a statistically significant change in five out of the seven core areas; two core characteristics also showed improvements, but these improvements were not statistically significant (table 3).

Improved opioid monitoring (chart review)

Patient education improved significantly between baseline and 6 months from 18% to 68% of items were partially or fully accomplished ($p<0.05$). Moreover, patient monitoring improved between baseline and 6 months from 51% to 67% of items partially or fully met, but the change was not statistically significant (table 4). It is worth noting, however, that we were not able to analyse changes in initial patient assessment or treatment initiation, as most participating physicians did not initiate new patients on opioids during the 6-month follow-up.

Qualitative data

Interview at T#1

In the first set of interviews, we spoke with nine participating physicians regarding the use of opioid guidelines,

Figure 2 Knowledge test average scores.

Table 3 Results for the Practice Self-Assessment Questionnaire

Core characteristic areas	% items with some implementation (range)		
	Baseline	6 months	P value
1. Initial patient assessment (9 items)	75 (61–94)	78 (64–94)	0.22
2. Initial treatment plan (9 items)	65 (44–89)	69 (47–89)	0.25
3. Patient monitoring and re-assessment (23 items)	58 (41–92)	65 (39–92)	0.01
4. Drug information (4 items)	54 (35–75)	65 (35–75)	0.05
5. Communication of prescriptions and other drug information (13 items)	78 (50–96)	87 (73–96)	0.02
6. Competency and education (2 items)	47 (25–100)	67 (25–100)	0.05
7. Patient education (9 items)	56 (39–78)	65 (42–78)	0.03

CME and the implementation and assessment tools available with the guideline. The interviews focussed on facilitators of, barriers to and attitudes towards the three topics.

The use of the opioid guidelines

Seven out of the nine participants described themselves as having only vague knowledge of the opioid guidelines

(a) Facilitators and perceived or potential benefits

Several respondents (n=4) spoke of the opioid guidelines as being ‘practical’ and ‘pragmatic’: “It’s what doctors do anyway,” said one of the participants. Another participant said that the guidelines address family physicians’ concerns in that they constitute a ‘safety net’, provide a ‘framework’ and are ‘not biased’. Another participant mentioned that the guidelines are ‘in line’ with existing ‘spirit and practice’.

(b) Barriers and criticisms

The main perceived barriers participants reported were the time and effort required to become familiar with the guidelines’ contents, to learn to navigate them and to perform the necessary documentation.

Four respondents described the guidelines as ‘labour-intensive’ and ‘horrendous’. All physicians spoke of preferring guidelines embedded in the EMR system, which is not the case for the current opioid guidelines. Some participants described their appreciation of easy-to-use mobile-phone applications for hypertension and diabetes guidelines, expressing their wish for a similar application to help manage opioid prescribing. In the absence of

electronic integration, participants commented, ‘an algorithm or chart’ would be helpful.

Further barriers included lack of familiarity or disagreeing with the tenets of the guidelines. The physicians as a group expressed conflicting attitudes toward opioid guidelines. Some said that guidelines ‘make sense’ while others held the opposite view. One respondent said that they do not use guidelines unless required for billing purposes. These barriers, said two participants, meant that they rarely referred to the opioid guidelines in spite of treating patients on opioids.

Disagreement with the guidelines included complexity of pain management, considerations regarding the dose and formulation and the use of doctor/patient contracts. Four of the doctors explicitly commented on the complexity of pain and its resistance to ‘management by guidelines’. One participant cautioned, that chronic pain is unlike the other diseases for which there are guidelines in that there are ‘no clear cut answers’. One of the participants argued that the rules about controlled-release and immediate-release opioids are flawed. Another said that if a patient is currently stable on their dosage, ‘I might not adhere’ (to the guidelines); ‘patients vary’. One of the participating physicians highlighted that some aspects of the guidelines are particularly difficult to implement: for example, the doctor/patient contract for opioids. They said that such a practice is ‘very offensive’ especially with a long-standing patient who may feel they are being perceived as ‘an addict’ and ‘untrustworthy’. “It took me a long time to talk him down,” said one doctor about broaching the topic of the contract recommended in the guidelines.

Continuing medical education (accredited CME and other forms of learning)

(a) Facilitators

Most of the respondents mentioned their preference for online education programme, especially the Self-Assessment Programme as they usually provide an opportunity for ‘facilitated discussion’. Several respondents identified specific topics for further learning after

Table 4 Chart review checklist

% of items partially or fully meet expectations	Baseline (mean)	6 months (mean)	P value
Patient education	18%	68%	<0.05
Monitoring	51%	67%	NS

Only two items are shown because the other items did not apply to the 6-month follow-up as none of the physicians started any patient on new opioids.

completing the Self-Assessment Programme, for example the theory/practice gap in opioid prescribing; the distinction between physical dependence and addiction, and monitoring and urine drug screening, especially with regard to patients on opioids that they inherited from other physicians.

(b) Barriers

Barriers to benefitting from CME included ineffective delivery formats such as lectures, or content that is too basic or that lacks practice tips. Time and money also constitute barriers to attending CMEs. Several participants said, 'other than online, they were all expensive relative to the number of points'. In addition, some mentioned their distrust of 'pharma-sponsored events' (ie, those educational events paid for by the pharmaceutical industry). Finally, one of the participants said that 'the real problem' is that the College of Family Physicians of Ontario does not currently mandate uptake of opioid-related CMEs.

Implementation and assessment tools

(a) Facilitators

Five respondents mentioned the integration of tools such as the Opioid Manager into the EMR as a facilitator for the implementation of assessment tools. Checklists of 'smart templates' like the 'diabetes flow sheet' that automatically populate forms with applicable data would help with managing chronic pain with opioids. In addition, one participant suggested that 'working in collaboration with other healthcare providers would facilitate the implementation of assessment tools'. Another participant reported 'the whole practice did decide to monitor and assess their opioid patients'. Another participant suggested 'getting residents involved as part of their quality-improvement requirement, and bringing pharmacists on board to help'.

(b) Barriers

Five of the nine respondents said that time is one of the main barriers to using implementation and assessment tools; the guidelines, they believed, would not be used unless they were mandated by the province because of the time pressures facing doctors. One said that doctors do not see the value in using such tools unless out of 'fear of audit'. These respondents feel that there are 'too many checklists (within the Canadian Opioid Guidelines)' and using these tools would be too cumbersome with respect to current practice.

Interview at T#2

In the second interview, we asked the nine participants to describe their experience with the online Self-Assessment Programme, chart review checklist and Practice Self-Assessment Questionnaire.

Comments on the online self-assessment programme

Participants reported many positive aspects of the online learning tool, and most felt that it compared favourably to other CMEs they had undertaken, calling it 'amazing' and 'such a learning experience'. Participants praised particular features including advice on addressing patients' psychosocial issues, pain assessment, awareness of signs of opioid use disorder and conducting urine drug screening. Respondents appreciated having knowledge of the statistics about opioid use and accessing conversion calculations for various opioids. Other positive aspects included good information on patient screening, and on history-taking. Participants also reported that the tool provided a good overview and specific 'clinical pearls', along with helpful case examples and practical applications, while others commented that the module provided too much information, and said they felt 'concern' about the amount of guidance offered around opioid safety.

Some participants reported that the tool was easy to navigate, while other users encountered technical glitches and found navigating the site difficult, and requested 'less clicking'. If the tools or components were linked to patients' electronic medical records, respondents agree, they would be more used and more useful; the Opioid Manager¹⁸ was cited as a good example of a useful tool.

Participants suggested changes to the tool included (a) more case examples in the module, (b) more information on 'legal stuff', (c) a printed pamphlet with resources listed and (d) a 'live' CME about the guidelines.

The practice self-assessment questionnaire

Similar to the online Self-Assessment Programme, participants reported several positive aspects on the practice self-assessment questionnaire. Participants liked the thorough coverage of opioid-related practice issues; they felt it was user friendly and easily navigable. One participant said it helped to 'reinforce' existing knowledge and another that it helped to identify gaps in knowledge. One said that going through the tool provided a 'framework' to keep in mind for treating patients with chronic pain.

When asked about facilitators that might encourage use of the tool, a number of respondents said that if it were somehow incorporated into their EMR, they would be more inclined to return to it.

More than one participant suggested including items concerning patients' psychosocial needs. One mentioned 'urine drug screening' as a topic that could have been better covered. A participant suggested that giving different weights or priority to items in the checklist would help them allocate time during the clinical encounter. There were two respondents who struggled to recall completing the tool at all. One interviewee talked of being surprised at knowing more about some topics than they anticipated and less about others.

Barriers to uptake included the large number of items — 70 in all — which seemed 'extensive' and might 'scare doctors away' from using the tool; one respondent called it 'intimidating as hell'. The wording in the tool was

occasionally seen as ambiguous or awkward. One respondent said it would be 'impractical' for use in a large practice.

Perspectives on the chart review checklist

All nine physicians received written feedback on their reviewed charts and a phone call from one of the experts on the project (PL). The checklist was described as a 'huge upside'. Participants appreciated getting 'an outside view' of their practice. The checklist was very helpful as a prompt to ask psychosocial and sexual questions and more generally 'being a safe physician'.

As a facilitator, one suggested 'online fillable template' would be useful because 'you're self-assessing every time you see a patient'. Seeing patient improvement was also described as a facilitator. Participants also suggested prioritising the most important items in the chart audit and a 'printout' with key points for improvement.

One participant said, however, "you'll be disappointed initially at poor results". The exercise involved lots of 'documentation'; one respondent felt that 'older', 'solo doctors who continue to run paper-based' practices would find such an audit more onerous. One participant in particular expressed concern about damaging their relationship with patients as a result of pursuing 'difficult conversations'. There was some concern expressed about whether the proffered feedback and advice were 'evidence-based' (as opposed to 'best practice'). Participants felt somewhat suspicious about how 'evidence' translates on the ground — or in their practice — to individual patients.

Views on the OSA package

We asked physicians for their views about implementing the OSA package more widely, and continuing their own engagement with the programme. Participants offered a plethora of ideas for promoting ongoing implementation and widening engagement, including offering or increasing the value of CME credits for improving opioid prescribing, getting opioid management into residents' curriculum, identifying and engaging 'practice champions' to promote and be a resource for opioid prescribing and ensure monitoring tools are integrated into the EMR. One participant said, 'Make it (the opioid prescribing guidance) mandatory'. More broadly, respondents said it is essential to 'change the culture' of managing chronic pain, and that doctors must be convinced that 'there's a better way to do opioids'.

Participants listed 'time' and 'tedium' as the main barriers to further or more involvement in the OSA. They talked about the difficulties of dealing with pain management as one problem among many facing them: 'family doctors have hundreds of issues — it's difficult to focus on just one'.

In addition, participants repeatedly mentioned the difficulties of engaging in 'difficult' or challenging conversations with patients and wished for more help with and examples or scenarios involving such encounters. At the

same time, there was also much appreciation registered about the online, self-directed and self-paced nature of the tutorial components.

Interview at T#3

In the third round of interviewing, eight study physicians participated and were asked about their experience with improving opioid prescribing since participating in the OSA package. A recurring theme in the responses is the importance or relevance of a given tool or resource — conversion guides, flow sheets, assessments — being linked seamlessly into the physician's EMR or otherwise not more than two or three clicks away.

Another topic that recurred multiple times was that of 'inherited' or 'legacy' patients, that is, those who are already using opioids prescribed by another physician, and who are now the responsibility of the respondent. The problems facing these cases in terms of achieving responsible, appropriate opioid dosing are seen as more difficult, although, as one doctor said, the discussion of rules and expectations should be the same for these patients as for one's 'own'. 'The patient may not be new to opioids, but the patient is new to this practice'. Introducing risk mitigation measures, or tapering such patients to reduce their opioid consumption, participants described as challenging.

The theme of conducting such 'challenging conversations' with patients, including discussions requesting or discussing results of a urine drug screening, requesting a treatment contract and asking questions pertaining to psychosocial history or current living situation, is another one that emerges across interviews. Some doctors reported these situations as very difficult and regarded the 'scenarios' that model techniques for conducting such conversations as the best part of the Self-Assessment Programme. Other doctors state that they have no trouble discussing these topics with patients.

Finally, physicians spoke of the utility of the guidelines or the relevance of the lessons learnt through the Self-Assessment Programme, as being variable. "I'm sort of using what I need... not fulfilling most of the check off boxes," said one, relying on a strategy that might be termed 'selective adoption.'

DISCUSSION

This pilot study assessed changes in family physicians' knowledge and practices in safer prescribing and monitoring of opioids after completing the OSA package. We used a mixed method evaluation including quantitative and semi-longitudinal qualitative data collection with a pre-post design in a small sample of family physicians from Ontario who collectively provided primary care to 11 050 patients, of those 925 have chronic pain, and 315 are on long-term opioid therapy.

Our results demonstrate that the average knowledge scores improved significantly after completing the online Self-Assessment Programme and that they retained this

knowledge for 6 months. We showed that providing physicians with point-of-care practice tools (eg, opioid conversion, urine drug screening and the Opioid Manager) facilitates the implementation of clinical practice guidelines. Participating physicians' scores also improved significantly in five out of the seven core characteristics of safer opioid prescribing practices. We observed improvement in the chart review checklist in patient education between baseline and 6-month post intervention. As a result of the successful outcomes shown through this pilot study, we were awarded further funds from Health Canada's Substance Use and Addictions Program in 2018 which will allow the CME accredited online Opioid Self-Assessment Programme to be offered free of charge to all prescribers, learners and educators across Canada from 2019 to 2021.

Physicians who used the OSA package appreciated the embedded resources, the dose conversions and the scenarios that modelled difficult doctor/patient discussions in the online module. They complained about the volume of information, the technical glitches and the confusing terminology.

Participants said that the practice self-assessment questionnaire helped them to identify gaps or deficits in their own practice and served as a useful reminder to discuss risk and safety with patients. The drawbacks, however, included the tool's length, complexity and ambiguity.

Participants expressed greatest enthusiasm for the chart review and the one-to-one feedback discussion, offering them 'clinical pearls'. These personal discussions helped the physicians to initiate needed discussions with their patients, to identify their own deficits and strengths and served as a 'primary motivator' for project participation. Drawbacks included the need for lots of documentation and experiencing disappointment at one's poor results.

Taking the quantitative and qualitative data together, the results of this pilot study suggest that our intervention successfully incorporates educational materials and assessment tools and significantly improved family physicians' knowledge and practice behaviour.

Limitations

This is a pilot study with a small sample of family physicians who participated in an intervention aimed at implementing the 2010 Canadian Opioid Guideline. The completion of the Opioid Self-Assessment Package is very time consuming and resource intensive, which limits its uptake by busy prescribers, and implementation by organisations that cannot dedicate a project coordinator. The generalisability of the results is limited by the geographical location in Ontario and practices mainly using electronic medical records.

We expected that over the course of the 6 months between baseline and follow-up there would be one or more new patients with chronic pain initiated on opioid therapy. However, we found that participating physicians did not initiate any patient during that period. Perhaps this is a reflection of fewer physicians initiating opioids

for chronic pain after the release of the Canadian Opioid Guidelines in 2010 and updated in 2017.

Comparison to prior studies

Our results are similar to other studies that compared multidimensional approaches aimed to increase clinicians' adherence to evidence-based prescribing practices. A recent cluster-randomised trial among 53 primary care clinicians by Liebschutz *et al* showed that a multicomponent intervention with an electronic registry, data-driven academic detailing and electronic decision tools showed a significant improvement to adherence to opioid-prescribing guidelines and a significant decrease in early refills of opioids in patients with chronic pain when it was compared with electronic decision tools alone.²⁴ Another study conducted at the Mayo Clinic described the results by a rural primary care practice that effectively implemented opioid prescribing guidelines. The elements of the strategy included prescribing registries, a nurse coordinator and an Opioid Use Review Panel. Clinic workflow was redesigned to more consistently incorporate these and other guideline recommendations into practice. They included 5 physicians in phase 1 and added 18 to phase 2 of the implementation study. They showed a decrease in the number of patients using chronic opioid therapy, primarily at lower doses.¹²

Recommendations for future research

There is a need to continue studying multifaceted strategies to implement the most recent version of the Canadian Opioid Guideline in primary care. The OSA package showed promising results, however, there is a need to revise its components to reduce the burden and improve uptake of these tools. More studies are needed to evaluate the impact of the OSA package on opioid tapering, and the reduction of opioid-related overdoses and death. A cluster randomised trial would be useful to expand the results from this descriptive study.

CONCLUSIONS

Our study assessed changes in family physicians' knowledge and practices in safer prescribing of opioids after completing the OSA package, which included a knowledge test of opioid-prescribing practices, an online education programme, a self-assessment questionnaire and an audit-and-feedback component on opioid prescribing practices.

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