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Perceptions among Alberta Healthcare Professionals of Prescription Drug Misuse

Final Report

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Conflict of Interest

Amy J. Porath-Waller has no conflicts of interest to declare.

Jonathan E. Brown has no conflicts of interest to declare.

Aarin P. Frigon has no conflicts of interest to declare.

Executive Summary

The Issue

Although prescription drugs such as opioids, stimulants, sedatives and tranquillizers are legal and prescribed for therapeutic purposes, there are a number of harms associated with their use. The addiction, withdrawal, injury, overdose and death associated with prescription drugs have been identified as a significant public health and safety concern across North America. For example, nearly one in every eight deaths were opioid-related among individuals aged 25-34 years in Ontario in 2010 (Gomes et al., 2014). Although healthcare professionals play a critical role in addressing this issue, few studies have examined their part in identifying and preventing prescription drug misuse[1] (PDM) among patients; of those studies that have, most focused on opioids alone.

This study investigated the perceptions among Alberta healthcare professionals, including physicians and surgeons, registered nurses and nurse practitioners, pharmacists and dentists, of the misuse of prescription opioids, stimulants and sedatives and tranquillizers. A clearer understanding of healthcare professionals' perceptions of PDM can help to inform the development of educational and prevention and intervention initiatives and to improve the capacity to address this public health and safety crisis.

The Study

Guided by a panel of researchers and clinical experts, this study investigated perceptions among 1,063 healthcare professionals of:

1. The extent and distribution of PDM among patients;
2. Clinical characteristics of PDM;
3. Risk factors for PDM;
4. Barriers to identifying PDM in patients;
5. Communication among healthcare professionals regarding prescriptions; and
6. Strategies for preventing and addressing PDM.

As well as providing a greater understanding of PDM from the perspective of those closely involved, the present findings could help inform the development of a multidisciplinary screening tool that addresses specific classes of drugs.

Results

Estimates and Clinical Characteristics of Suspected PDM

Opioids, stimulants, and sedatives/tranquillizers were the three drug classes studied. The study found that healthcare professionals' perceptions of PDM were dependent upon drug class and

[1] Prescription drug misuse was defined for the purposes of this study as "the use of a medication for a medical purpose other than as directed or indicated, whether intentionally or unintentionally, and whether harm results or not."

patient characteristics. Specifically, practitioners suspected adult and senior patients and patients with a mental health diagnosis to be misusing sedatives/tranquillizers more frequently than opioids or stimulants. In contrast, practitioners perceived that patients with chronic pain or a history of substance abuse were more likely to misuse prescription opioids as compared to the other drug classes. There were no differences in suspected youth misuse of any of the prescription drug classes.

Healthcare professionals reported that the following patient actions were strong indicators of PDM:

- Altering the delivery method of a prescription drug;
- Forging prescriptions;
- Double doctoring;
- Doctor shopping; and/or
- Using medications differently than were prescribed.

The expression by family members or caregivers of worry about prescription drug use was also a strong indicator of PDM. Pharmacists were more likely than physicians, dentists and nurses to believe that patient requests for certain medications to not be billed through their routine insurance plan and for medication to be dispensed in the original manufacturer's container as greater indicators of PDM.

Risk Factors, Identification and Prevention of PDM

Despite respondents' reports that risk factors for PDM are generally too difficult to determine, they thought that previous and active alcohol and drug use could be a stronger risk factor for PDM than patient characteristics such as age and gender. Participants felt that PDM identification was hindered by factors such as a lack of patient honesty, health professionals' lack of communication with patients and their families, and health professionals' reluctance to talk to patients about PDM. Participants also reported a lack of communication with the patient's other healthcare professionals, limited access to chronic pain or addiction specialists, and difficulty accessing provincial databases on prescribing data as additional barriers to identifying PDM.

Perhaps most importantly, professionals mentioned their own inadequate education and training and the confusing and vague symptoms of PDM as a barrier to identifying PDM. Given these barriers, it was not surprising that participants did not feel they were very effective in preventing and addressing PDM among their patients. Significant differences were observed among the various professions as to their sense of their effectiveness. Nurses were the least likely to report feeling effective in addressing PDM, followed by pharmacists, dentists and physicians.

Most respondents did not feel that they had adequate support for preventing and addressing PDM. They stated that better connections with chronic pain and mental health professionals would be the most effective strategy to prevent and address PDM among their patients. The next most effective strategies would be developing guidelines for risk management and prescribing, and offering education programs about prescribing.

Communication among Healthcare Professionals

In general, participants reported positive interactions with other health professionals. Most often, these communications were about prescription opioids. However, pharmacists did report that

physicians were difficult to reach by phone, did not promptly return phone calls and were not overly receptive to their concerns. The respondents felt that learning to work together and respecting each other's disciplines would improve communication among healthcare professionals and was identified as the best way to provide patients with the best possible care. Communication could be further supported by the development of a reporting database that would allow all healthcare professionals to access and share electronic records of patient healthcare information.

Discussion

This is the first known study to examine perceptions of PDM among physicians, dentists, pharmacists and nurses. While there were some similarities, there were also differences in key areas of perceptions of PDM across the four groups, demonstrating the importance of including multiple healthcare professions and multiple drug classes in research related to the harms associated with prescription drug use. The research also found that healthcare professionals do not perceive PDM to be consistent across a population; rather they perceived it to be dependent on the prescription drug category and patient characteristics.

As previously observed, participants reported that it was almost impossible to identify risks factors for PDM, yet they perceived certain patient characteristics and behaviours to indicate possible PDM. An important implication of these findings is that they could inform the development of a multidisciplinary screening tool that addresses different drug classes to assist in identifying PDM among patients. The tool could help prevent both stereotyping of "abusers" and under-treating individuals who legitimately require pain-relief, as has been observed to occur in previous research. Since perceptions of PDM can be influenced by personal biases and experiences, further research on the factors that can lead to PDM is required to validate the perceptions of PDM observed in the current study.

The findings of this study raise the concern that healthcare professionals do not believe they are overly effective in preventing and addressing the harms associated with prescription drug use and most do not feel supported to do so. Similar results have been documented in previous studies, wherein health care professionals have reported receiving little addiction and pain management training. Professional colleges and associations are well placed to recognize the importance of providing continuing education that addresses the identification of PDM and the potential for screening, brief intervention and referral, as well as guidelines, policies and regulations for risk-management and prescribing practices. Indeed, *First Do No Harm: Responding to Canada's Prescription Drug Crisis*, published in March 2013, outlines several recommendations to improve prevention efforts and educate health professionals on the harms associated with prescription drugs.

In the current study, healthcare professionals identified strategies that could be effective in addressing PMD. Specifically, improved communication among physicians and pharmacists, and connections with pain, mental health and addiction specialists were cited as ways to help address PDM. Communication and teamwork among professionals should be encouraged and could be informed by a needs assessment completed by all involved parties. Treatment system planners and decision makers can facilitate communication by advancing the existing electronic health records system. Improving access to this system by making it available to all prescribers and dispensers, as well as including all medications in the system, could contribute significantly to the prevention and identification of PDM. With these aids in place, healthcare professionals will be better equipped to prevent, identify and reduce the harms associated with prescription drug use among their patients.

Introduction

The harms associated with prescription drugs such as opioids, sedatives or tranquillizers and stimulants are emerging as a significant public health and safety concern across North America. Although these drugs are legal and are prescribed for therapeutic purposes, they share a potential for misuse because of their psychoactive properties and associated risk for psychological and physical dependence. Prescription drugs also have a high potential for harms such as addiction, withdrawal, injury and death (e.g., motor vehicle accidents, accidental overdoses, suicide) (Corneil, Elefante, May-Hadford, Goodison, & Harris, 2012; Dhalla et al., 2009; Expert Working Group on Narcotic Addiction, 2012; Wild, Wolfe, Newton-Taylor, & Kang, 2008). Factors that can influence the potential for experiencing prescription drug-related harms include their psychoactive effects, accessibility, perceptions of relative safety, opportunities for diversion along the supply chain, economic incentives and promotion by the pharmaceutical industry, enormous demand, proximity to markets, and low risk of arrest and prosecution (CCSA, 2013).

The exact prevalence of prescription drug misuse (PDM) in Canada is unknown, partly due to the fact that *how* the problem is defined can have a substantial impact on estimates (Shield, Ialomiteanu, Fischer, & Rehm, 2013). When looking across the various definitions, the estimates are disconcerting. Canada has the second-highest level of prescription opioid use globally, with a total of 29,743 Standardized Defined Daily Doses (S-DDD) of prescription opioids consumed in 2010–2012 (International Narcotics Control Board, 2014). Fischer, Jones and Rehm (2014) examined prescription opioid dispensing rates and patterns by province for 2005–2012 using a representative sample of 5,700 retail pharmacies across Canada. Findings revealed that annual total dispensing levels substantially increased in every province except Ontario. From 2011 to 2012, however, a decrease in dispensing levels was observed in British Columbia, Alberta, Saskatchewan and Ontario.

Smith and colleagues (2008) compared benzodiazepine dispensing data between 2000 and 2003 through Nova Scotia's Pharmacare Program and the Pharmaceutical Benefits Scheme in Australia a sample that largely comprised those aged 65 years and older. The study found that benzodiazepine use increased in both Nova Scotia and Australia during this period, with usage being twice as high in Nova Scotia than Australia. The authors suggested that the high use of benzodiazepines in Nova Scotia may be due to the province having a wider variety of these drugs available than Australia (17 vs. 5). The authors also noted that these findings were unsettling as previous research had reported that rates of benzodiazepine use were significantly lower in the Atlantic provinces compared to other provinces.

Recent data from the Canadian Alcohol and Drug Use Monitoring Survey (CADUMS) indicate that 24.1% of Canadians aged 15 and older reported using a psychoactive prescription drug in 2012, nearly unchanged from the 22.9% reported in 2011 (Health Canada, 2013). Of those who indicated that they used a prescription drug during the past year, 6.3% reported that they abused such a drug (i.e., they used it for the experience, the feeling it caused, to get high or for "other reasons"). Of the three categories of prescription drugs examined by the CADUMS, opioid pain relievers were the most commonly used in 2012, with one in six (16.9%) Canadians reporting past-year use, a rate unchanged from 2011 (16.7%). Among Canadian users of opioid pain relievers, 5.2% reported abusing these medications in 2012. Rates of past-year use of stimulants by Canadians increased in 2012 (1.5%) from 2011 (0.9%). In contrast, the prevalence of past-year use of sedatives and tranquillizers by Canadians in 2012 (10.2%) remained unchanged from 2011 (9.1%).

Certain populations have been identified as having higher rates of prescription drug use or misuse or experiencing related harms than the general population. For instance, in Ontario, 12.4% of students in Grades 7 to 12 reported taking a prescription opioid non-medically (i.e., without a prescription and

without a doctor's supervision) during 2013 (Boak, Hamilton, Adlaf, & Mann, 2013). Youth are considered at a higher risk for the harms associated with prescription drug use because they often perceive prescribed medication to be a safe alternative to illegal street drugs (Stoddard & Huggett, 2012; Twombly & Holtz, 2008).

Another population that is considered at risk for the harms associated with prescription drug use is females. Recent data from the 2012 CADUMS indicate that past-year use of any psychoactive prescription drug was significantly higher among females (26.7%) than males (21.3%), as was past-year use of sedatives or tranquillizers (12.8% for females vs. 7.5% for males) (Health Canada, 2013). Other groups identified as possibly at risk for experiencing prescription drug-related harms include seniors, Aboriginal peoples, and individuals with psychiatric conditions or concurrent disorders. Further research is needed to determine the extent and nature of the harms associated with prescription drug useamong these populations (CCSA, 2013).

In addition to the health-related harms associated with prescription drug use, a surge of criminal activity diverting prescription drugs from legal, regulated supply routes to illegal markets (Royal Canadian Mounted Police, 2010) has increased pressure on Canada's enforcement measures and potentially compromised their effectiveness. While cost estimates of the prescription drug misuse problem in Canada are lacking, recent research from the United States estimates the annual cost of non-medical use of prescription opioids to be more than $50 billion, with lost productivity and crime accounting for 94% of this amount (Hansen, Oster, Edelsberg, Woody, & Sullivan, 2011).

Healthcare Professionals' Perspectives of PDM

Few studies have examined the role of healthcare professionals in identifying, preventing or even inadvertently enabling the misuse of prescription drugs among their patients. Most research conducted to date has focused on prescription opioids and, to a lesser extent, benzodiazepines, with these studies involving samples of physicians, pharmacists and, to a smaller degree, nurses. Other studies have only ascertained the prevalence of PDM rather than the clinical manifestations or patient risk factors for this behaviour. Studies of healthcare professionals' perceptions of PDM have focused generally on issues of addiction. Understanding healthcare professionals' perceptions and experience in dealing with the misuse of prescription drugs can help inform the development of educational and prevention initiatives aimed at addressing this important healthcare issue and ultimately reduce associated harms.

Research has shown that physicians are concerned when it comes to prescribing opioids. Bhamb and colleagues (2006) discussed a number of studies that found that physicians are mostly concerned that opioid prescriptions will be misused and patients will become addicted. It was suggested that these perceptions have become problematic, as physicians have been found to be reluctant to prescribe opioids even in situations that warranted a prescription. Evidence has shown a reluctance to prescribe when patients presented with a history of substance abuse (Baldacchino, Gilchrist, Fleming, & Bannister, 2010; Potter et al., 2001) or chronic nonmalignant pain (i.e., non-cancer pain) (Bhamb et al., 2006; Joranson & Gilson, 2001).

In addition to affecting physicians' prescribing practice, patients' specific characteristics (e.g., age, history of substance abuse, chronic nonmalignant pain) may also play a role in the perspectives of healthcare professionals when identifying PDM (Baldacchino et al., 2010; Cook, Marshall, Masci, & Coyne, 2007; Joranson & Gilson, 2001; Potter et al., 2001). Baldacchino et al.'s (2010) qualitative study, noted that physicians' perceptions of patients with a history of substance abuse led them to adjust their prescribing methods. For example, if a patient presented with a substance abuse history, physicians immediately employed different management approaches and stricter prescribing

regimes than for patients presenting the same symptoms without a substance abuse history. Further, when treating patients with a substance abuse history, physicians tended to employ a preventative strategy for PDM. However, physicians were more likely to have used an intervention strategy for PDM with patients without a history of substance abuse.

Damestoy, Collin and Lalande (1999) examined physicians' perceptions of the elderly population and their decision making process involved in prescribing psychotropic medications (e.g., sedatives, hypnotics, anxiolytics, antidepressants) through semi-structured interviews. Physicians described patients who demonstrated behaviours often associated with PDM (Payne, Gething, Moore & Reid, 2011; Monheit, 2010; Wenghofer et al., 2011). For example, patients were described as having very strong attachments to their medication that resulted in being very resistant to any changes in their medication and becoming demanding or difficult when addressed about their medication use. Further, these physicians believed that their patients would seek out another physician if they were not satisfied with their prescription. However, physicians also believed it would be more detrimental for the patient's health not to prescribe. This could be because the physicians described aging as a negative process and that they were more concerned with short-term deterioration than long-term consequences.

Similar findings among the elderly population regarding benzodiazepine use were highlighted in the 2007 qualitative study conducted by Cook and colleagues. These authors reported that primary care physicians did not perceive benzodiazepine use among older adults as problematic because these patients did not demonstrate drug-seeking behaviour or escalating dose behaviour. The physicians also doubted the potential risks of long-term use in these patients. Overall, these results suggest that physicians' perspectives of the aging process could play a role in identifying and addressing the harms associated with prescription drug use in the elderly population. Furthermore, physicians noted that different measures are taken when prescribing for the first time vs. re-prescribing. For example, as the initial prescriber, physicians were careful about the diagnosis and prescribed small doses and quantities, and limited refills. When acting as a re-prescriber, physicians saw themselves as gatekeepers. Consequently, physicians' perceptions of their own role in the patient's medical regime may affect how they identify and manage PDM.

Payne and colleagues (2011) also concluded that a patient's age affects how primary care providers deal with PDM. The authors conducted a qualitative study that explored the perspectives of physicians and nurse practitioners regarding the extent and clinical presentations of misuse and abuse of psychoactive medications in patients over the age of 60. These primary care providers indicated that only a small percentage of older patients (~8%) were actively misusing or abusing their prescription medication. The primary care providers perceived several risk factors for the misuse of prescription drugs, including psychiatric disorders, previous substance abuse history, and cognitive impairment, but indicated that they found it impossible to predict which patients were at increased risk for engaging in this behaviour. As for the clinical manifestations of PDM or abuse, the primary care providers perceived that drug-seeking behaviours were the most common manifestation. Many different forms of this behaviour were observed in patients, including multiple phone calls to the office to ensure that monthly prescriptions were filled, numerous requests for early refills, and "doctor shopping" (i.e., going to different providers to obtain an opioid or benzodiazepine prescription). Primary care providers also identified several barriers to identifying patients who misused their prescription medication, including lack of communication (between provider and patient, provider and patient's caregivers, and between different providers), nonspecific symptoms, and the lack of standard, age-appropriate definitions of misuse and abuse.

In another Canadian study, Morley-Forster, Clark, Speechley and Moulin (2003) conducted interviews with a nationally representative sample of 100 physicians who had a defined interest in palliative

care or non-cancer pain. The study found a reluctance to use opioids for severe nonmalignant pain, even among physicians with experience in chronic pain management. Respondents indicated that a patient's potential for addiction and prescription drug abuse or misuse was the most common obstacle to prescribing. In addition, almost 40% of respondents indicated that a lengthy wait list was an issue because pain specialists and treatment facilities were not common where they practice. Furthermore, almost 60% of those surveyed believed that chronic pain management would be enhanced with physician education.

Wenghofer and colleagues (2011) also highlighted the need for further education among healthcare professionals in their study of primary care physicians in Ontario. Findings revealed that most physicians had encountered opioid-related adverse events and were concerned that their prescribing could inadvertently contribute to their patients' risk of overdose and addiction. The most commonly cited factors leading to adverse events were that the patient took more medication than prescribed, the prescribed dose was too high, or the patient took alcohol or sedating drugs with the opioids. The authors concluded that comprehensive educational strategies are required to promote safe prescribing of opioids, and these strategies should emphasize the clinical skills required to identify, prevent and manage opioid overdose, misuse and addiction.

Lafferty, Hunter and Marsh (2006) conducted a survey of 484 pharmacists attending three different continuing education programs in Florida. The study found that many of the respondents (67.5%) had less than two hours of addiction and substance abuse education, while 29.2% of pharmacists had no addiction education at all. Results also showed that pharmacists who indicated they had more education on addiction and substance abuse also felt more confident about counselling patients on PDM. In another recent study in the United States (N = 89), pharmacists perceived over twice as many patients to be abusing opioids than did prescribers (i.e., physicians and prescribing nurses). The researchers also found that both groups had low self-efficacy in discussing prescription drug abuse with patients (Hagemeier, Gray & Pack, 2013).

In contrast, in a study of 739 pharmacists in Utah and Texas, Cochran, Lawson and Erickson (2013), found that pharmacists had a positive disposition towards helping patients who misuse opioids and believed they had the confidence and knowledge necessary to work with patients who misuse opioids. Further, about half of their sample agreed that pharmacists should be actively involved in providing screening and brief intervention services Together, these results indicate that as long as education and training barriers are addressed, pharmacists are interested in identifying, preventing and intervening in prescription opioid misuse.

Kahan and colleagues (2011) explored pharmacists' beliefs, practices and experiences regarding opioid dispensing among a sample of 652 Ontario pharmacists. Results indicated that most of the pharmacists surveyed expressed concerns about opioid use in several or many of their patients, and these concerns were based on direct observations of patient behaviour, such as coming in for early refills and opioid intoxication. Pharmacists also reported concern with physician practices, such as prescribing benzodiazepines in combination with opioids. Many pharmacists also reported difficulty in communicating these concerns to physicians: 43% reported difficulty in reaching physicians directly by telephone and 28% indicated that physicians frequently did not return their phone calls promptly. The authors suggested that system-wide strategies are urgently needed to improve the safety of opioid prescribing and enhance communication between physicians and pharmacists.

Sheridan and Butler (2011) explored the challenges encountered by 16 community pharmacists and 17 general practitioners when faced with the issue of drug-seeking and PDM. The findings from this examination revealed that both groups of healthcare professionals encountered a series of challenges in managing PDM, including identifying the behaviour in patients, dealing with inappropriate requests

for prescription drugs, verifying the legitimacy of requests and managing threatening behaviours. Other difficulties reported by respondents included time and workload constraints, which affected the ability and willingness of the healthcare professional to take action and offer some type of intervention to the patient, as well as verbal abuse from drug-seeking patients.

The Coalition on Prescription Drug Misuse (CoOPDM) conducted six focus groups in Alberta with a total of 69 participants, including persons with lived experience, law enforcement professionals, pharmacists, downtown service providers, addiction and mental health treatment workers and physicians (Goldblatt, 2009). The study identified a number of overarching challenges, which included doctor and pharmacy shopping, prescribers and patients having inadequate knowledge about medication that can lead to improper prescribing and use, as well as communication barriers among service providers that make it difficult to assess and follow-up on problems and coordinate responses. In particular, physicians were identified as lacking training on assessment and treatment specifically for pain management. The author further argued that physicians were not exercising good judgment when prescribing medications (e.g., prescribing opioids to patients with opioid addictions, overprescribing medications with a high potential for addiction). Pharmacists were found to face barriers in communicating with physicians. These barriers included physicians being difficult to reach and not receptive to being questioned about their prescribing practices. Pharmacists were also found to face barriers when communicating between pharmacies due to patient privacy.

The Purpose of the Study

In response to the growing problem of the harms associated with prescription drug use in Canada, the Canadian Centre on Substance Abuse (CCSA), in partnership with the National Advisory Council on Prescription Drug Misuse (NACPDM), recently released a comprehensive 10-year, pan-Canadian strategy: *First Do No Harm: Responding to Canada's Prescription Drug Crisis* (CCSA, 2013). The strategy outlines 58 recommendations to address the harms associated with prescription drugs in Canada in the areas of prevention, education, treatment, monitoring and surveillance, and enforcement. The *First Do No Harm* is now in its second year of implementation of these recommendations.

In *Creating Connections: Alberta's Addiction and Mental Health Strategy* (2011), the Government of Alberta acknowledged the importance of PDM as well as the need to improve the capacity of its workforce to effectively address this growing healthcare issue. In addition to this strategy, Alberta's Office of the Chief Medical Officer of Health in their report '*Prescription Drug Misuse in Alberta: Everyone's Problem*' outlined a strategy that focused on improving patient safety through enhancing safe prescription practices (Government of Alberta, 2011). A clear understanding of how healthcare professionals within Alberta perceive PDM is therefore needed to inform the development of local strategies and solutions and ultimately support the implementation of the province's Addiction and Mental Health Strategy. Accordingly, the purpose of this study is to investigate the perceptions of the PDM problem among a sample of healthcare professionals from Alberta, including physicians and surgeons, registered nurses, pharmacists and dentists.

More specifically, this study aimed to identify healthcare professionals' perceptions of:

- The extent and distribution of PDM;
- Clinical characteristics of PDM;
- Risk factors for PDM;
- Barriers to identifying PDM;

- Communication among healthcare professionals regarding prescriptions; and
- Strategies for preventing and addressing PDM.

A number of these perceptions were also assessed to determine if they differed across the groups of healthcare professionals.

Method

This study used a cross-sectional design, in which self-report data were collected through an anonymous online survey. This project adopted an integrated knowledge exchange model to help ensure uptake and use of research findings. An expert panel was formed, consisting of representatives from CCSA, CoOPDM, NACPDM, the College of Physicians and Surgeons of Alberta (CPSA), the Alberta College of Family Physicians, the Alberta Dental Association and College (ADA+C), the Alberta College of Pharmacists (ACP), and the College and Association of Registered Nurses of Alberta (CARNA). (See Appendix A for expert panel membership.) The expert panel assisted in the development of the survey and the interpretation of the study's results. This study received ethics approval from the Health Research Ethics Board of Alberta — Community Health Committee (formerly the Community Research Ethics Board of Alberta) and was funded by Alberta Health.

Development of the Survey

A draft version of the survey was developed based on a literature review as well as input from the expert panel. The survey consisted of primarily closed-ended quantitative questions, with a small number of open-ended questions, and took 15–20 minutes to complete. To increase the potential that all participants would use an identical conceptualization of PDM when answering the questions, the following definition was provided at the beginning of the survey:

> The use of a medication for a medical purpose other than as directed or indicated, whether intentionally or unintentionally and whether harm results or not. Examples of unintentionally misusing prescription medication could include using a prescription incorrectly either because of misunderstanding instructions or a faulty memory (e.g., taking the wrong dosage). Examples of intentionally misusing prescription medication could include using the medication incorrectly for recreational use (e.g., to get high) or for the medication's therapeutic benefits (e.g., to help relieve pain, to improve concentration, to help sleep, to change one's mood, etc.).

The survey contained eight sections. The first asked participants to estimate the percentage of their patients who are currently prescribed each of the three categories of prescription drugs (i.e., opioids, stimulants, and sedatives or tranquillizers) on a four-point quartile rank scale. Using the same scale, the survey then asked participants to estimate the percentage of patients currently known and suspected to be misusing each of these three classes of prescription drugs. This section allowed for the estimation of PDM according to patient characteristics (e.g., age, history of substance abuse, mental health diagnoses, chronic pain) and provided insight into healthcare professionals' perceptions of the extent of PDM among their patients.

The second section of the survey asked participants to rate the degree to which certain patient behaviours are indicative of PDM. These behaviours have been identified and discussed in previous research as possible clinical presentations of PDM. Participants were also presented with two open-ended questions that asked them to identify additional patient behaviours that may indicate PDM and how they may have initiated discussions with patients or attempted to manage their PDM.

The third section of the survey asked participants the degree to which they believe certain patient characteristics serve as risk factors for PDM. Previous researchers have argued that healthcare professionals' prescribing practices may be influenced by specific patient characteristics (e.g., age, gender, history of substance abuse), and this may also lead to an increased likelihood of attributing

PDM to patients demonstrating these characteristics (Baldacchino et al., 2010; Cook et al., 2007; Joranson & Gilson, 2001; Potter et al., 2001).

In the fourth section of the survey, participants were asked to rate the degree to which certain factors present barriers to identifying PDM in patients. This section also contained branched questions that were presented according to the participant's healthcare group (i.e., physicians and surgeons, dentists, pharmacists, or registered nurses and nurse practitioners). For example, only physicians were asked about the potential barrier of "not being the initial diagnosing physician." This process ensured that participants were asked only relevant questions. Data from these questions were used to identify key areas for future intervention efforts to help improve healthcare professionals' ability to identify PDM.

The fifth section of the survey asked participants about how effective they feel they are in preventing and addressing PDM among their patients. They were also asked to rate the potential effectiveness of several strategies in helping healthcare professionals to address PDM. Data from these questions will help direct future educational and prevention initiatives at the healthcare professional level.

The sixth section of the survey addressed communication among healthcare professionals regarding prescriptions for opioids, stimulants and sedatives or tranquillizers. This section also included branching questions that were dependent on the participant's specific healthcare group. Previous research has identified a number of issues that can arise when members of different healthcare professions interact or do not interact with each other (Kahan et al., 2011; Wenghofer et al., 2011). Together, the various healthcare professions can play an important role in addressing PDM; therefore, it was necessary to understand key aspects of their interaction.

The seventh section of the survey contained a brief set of questions that addressed participants' perceptions of the different types of PDM. Previous research has raised concerns about the use of a single, all-encompassing operational definition of PDM that does not account for different motivations (Barrett, Meisner, & Stewart, 2008; Zacny & Lichtor, 2008). The misuse of prescription drugs can occur intentionally for recreational reasons (e.g., to get high), or for the therapeutic benefits of the medication (e.g., using an opioid as a sleeping aid rather than pain relief for which it was prescribed). Data from these questions will help to determine if healthcare professionals share these definitional distinctions.

The final section of the survey presented a variety of demographic questions to identify the characteristics of the sample.

Pilot Study

The draft version of the survey was pilot-tested to ensure that healthcare professionals would understand and have the capacity to answer the questions. The amount of time required for participants to complete the online survey was also assessed. Members of the expert panel were asked to recruit a convenience sample of participants for the pilot study. Potential participants were asked to contact the research team and learn more about the purpose of the pilot study and its timeline. Individuals who agreed to participate in the pilot study were given a link to the online survey to complete on their own time. Then during a scheduled time, pilot study participants took part in an online focus group to discuss the survey content, comprehension of questions, face validity, and amount of time required to complete the survey. Pilot study participants received a $20 honorarium for their participation.

For the pilot, a total of three pharmacists, three nurses and one dentist participated in one of two one-hour focus groups. During these, participants identified wording concerns with items in the

demographic section of the survey that resulted in minor revisions. Participants also identified concerns with the first section of the survey that asked to estimate the percentage of patients that were prescribed, known to misuse and suspected of misusing each of the three categories of drugs. In the original draft of the survey, responses to these questions were open-ended, allowing participants to report any value between 0% and 100%. In the pilot study, participants indicated that answering these questions required a considerable amount of time, especially if all of the patient categories were applicable to the participants. Following the focus groups, these survey items were revised to a four-point quartile rank scale to allow participants to quickly arrive at an estimate of the proportion of their patients that represented the group in question.

Recruitment Strategy and Study Procedure

Participants were sampled from the following four healthcare professional populations in Alberta:

- College of Physicians and Surgeons of Alberta (CPSA)
- Alberta Dental Association and College (ADA+C)
- Alberta College of Pharmacists (ACP)
- College and Association of Registered Nurses of Alberta (CARNA)

Each of these colleges and associations maintains a database of its current membership. Together, these databases constituted the sample frame for this study. Participants were eligible to take part in this study provided they were registered members of one of the four colleges and associations.

As summarized in Table 1, five procedures were used to recruit participants.[2] First, ACP and CARNA provided the research team with a database of email addresses of members who had agreed to participate in research. The database for pharmacists contained 3,798 email addresses, while the database for nurses contained 16,005. Pharmacists and nurses were directly emailed a survey invitation from the research team. This email contained a brief description and a link to the online survey. The invitation also stated that the research team would donate $10 to the Red Cross Alberta Flood Relief Effort for every survey completed.

Table 1: Recruitment Procedure Summary

Recruitment procedure	CPSA	ADA+C	ACP	CARNA
Direct email from research team			4	4
Direct email from college/association		2	1	
Advertised in college/association newsletter	2		1	
Link to survey posted on college/association website	Yes	Yes		
Mailed postcard advertisement	10,460	2,153	3,882	

Upon accessing the survey, participants were provided additional information about the survey and were required to provide informed consent before being able to access the survey. At two, nine and

[2] All materials used to recruit and communicate with study participants, including the survey questionnaire itself, are available upon request.

12 weeks after the initial email, pharmacists and nurses were directly emailed reminders about the survey. It is important to note that the email database for nurses contained a number of invalid email addresses. Therefore, after the initial email, the database resulted in only 14,751 deliverable emails.

The second recruitment procedure involved sending a direct email to potential participants via their member college or association. The ACP sent one direct email to pharmacists, whereas the ADA+C sent two direct emails to dentists. The third procedure involved advertising the survey through college and association newsletters. The CPSA posted a link to the survey in two editions of its monthly newsletter and the ACP posted a link to the survey in one edition of its monthly newsletter. The fourth recruitment procedure was the posting of a link to the survey on college and association websites, which was adopted by the CPSA and ADA+C.

During the recruitment procedures described above, it became apparent that participation rates of physicians, dentists and pharmacists were well below expectations. As a result, a fifth procedure was introduced that involved mailing a postcard advertising the survey. The ACP and ADA+C provided the research team with mailing addresses for their members, whereas mailing addresses for members of the CPSA were accessed from the college's website. The postcard advertisements were not sent to members of CARNA, because the participation rates from that professional association were in line with expectations. A total of 16,495 postcards were mailed out to healthcare professionals across Alberta.

After completing the survey, participants received a debriefing form outlining again the purpose of the study, contact information for the study investigators, and links to additional resources related to the topic. All data for this study were collected from November 13, 2013, to February, 21, 2014.

Participants

A total of 1,063 healthcare professionals from across Alberta completed the survey. Table 2 shows the sample size distribution across the four healthcare professional groups as well as the Alberta Health service zone in which participants reported working. Nurses comprised the largest group of participants, representing 61.1% of the total sample.

Table 2: Participant Sample Size and Service Zone Distribution

Professional group Total number (%)	Physicians 99 (9.3%)	Dentists 112 (10.5%)	Pharmacists 202 (19.0%)	Nurses 650 (61.1%)	All 1,063
North	8.1%	11.6%	10.4%	10.5%	10.3%
Edmonton	26.3%	37.5%	35.1%	30.8%	31.9%
Central	13.1%	11.6%	11.4%	10.5%	11.0%
Calgary	33.3%	31.3%	31.2%	34.3%	33.3%
South	12.1%	3.6%	7.4%	9.5%	8.7%
Multiple	3.0%	0.9%	2.0%	1.4%	1.5%
Don't Know	1.0%	0	1.0%	0.6%	0.7%

The distribution of participants across the Alberta Health service zones was consistent across the groups. Analyses revealed no significant association between participant group and service zone, χ^2 (18, N = 1036) = 14.28, p = .711. Comparing the distribution of the sample to the population distribution is difficult, as only ADA+C identifies its membership using the same regional breakdown. Data from ADA+C indicates the distribution for the North, Edmonton, Central, Calgary and South regions to be 8.3%, 38.0%, 8.2%, 39.4% and 6.3%, respectively. CARNA uses a breakdown similar to the Alberta Health Service zones, which allows for the North, Edmonton, Central, Calgary and South regions to be estimated at 8%, 36%, 9%, 37% and 7%, respectively. Similar geographical data could not be obtained from CPSA or ACP. Taking into consideration the population data from ADA+C and CARNA and that the samples obtained from each group in this study are similarly distributed, it can be concluded that this study's sample is geographically representative of the population.

Looking at the size of the city or town that the participants worked in, 65.9% reported working in a city with a population greater than 100,000 people, 10.8% in a city between the size of 60,000 to 99,999, and 23.3% in locations with populations less than 60,000. Consistent with these results, 77.3% of participants indicated they worked in an urban setting.

Participants' Gender, Age and Years of Service

The sample was comprised mostly of women (77.1%). Across the entire sample, participants' ages ranged from 21 to 81 years (M = 46.40, SD = 12.50). Table 3 illustrates the distribution of means and standard deviations of participants' ages, years of practice, and years registered in Alberta among the four healthcare groups. Group difference in participants' ages were found, F(3, 1007) = 16.41, p < .001. Follow-up analyses using a Bonferroni correction to control for Type I error revealed that pharmacists were, on average, younger than each of the three other healthcare groups (in all cases, p < .001).

Table 3: Participants' Mean Age, Years of Practice, and Years Registered in Alberta

Participant characteristics	Physicians	Dentists	Pharmacists	Nurses	All
Age (*SD*)	48.95 (12.62)	46.59 (12.87)	40.99 (11.78)	47.69 (11.78)	46.40 (12.50)
Years of Practice (*SD*)	21.03 (13.30)	20.62 (13.13)	16.52 (12.34)	21.58 (12.94)	20.45 (13.00)
Years Registered in Alberta (*SD*)	16.35 (12.00)	18.70 (13.24)	15.53 (12.26)	18.66 (11.99)	17.85 (12.23)

Years of practice across all participants ranged from 0 to 55 (M = 20.45, SD = 13.00), with group differences noted, F(3, 1037) = 7.89, p < .001. Follow-up analyses revealed that pharmacists reported being in practice for fewer years than physicians (p = .029), dentists (p = .045) and nurses (p < .001). Years registered in Alberta ranged from 0 to 50 (M = 17.85, SD = 12.23) and differed among the healthcare groups, F(3, 1037) = 4.02, p = .007. Specifically, pharmacists reported fewer number of years registered in Alberta compared to nurses (p = .01), which is consistent with the pharmacist group being younger than the other healthcare groups.

Participants' Area of Practice

Of the 99 physicians who completed the survey, 63.9% reported that they worked in family medicine, 12.4% in emergency medicine, 6.2% in psychiatry and 4.1% in internal medicine. The remaining

13.4% included specialties such as anesthesia and obstetrics. A total of 78.6% of physicians reported attending medical school in Canada.

A total of 85.4% of the 112 dentists in this study reported working in a general practice, while 5.2% said they worked in orthodontics and 3.1% in periodontics. The remaining 6.3% included specialties such as pediatric dentistry, endodontics and prosthodontics. Most of the dentists (87.5%) reported attending dentistry school in Canada.

Of the 202 pharmacists in the study sample, 69.2% indicated that they worked in a community pharmacy, while 18.9% worked in a hospital pharmacy and 11.9% in another type of pharmacy (such as a primary care network or ambulatory clinic). Ninety-three percent of pharmacists had completed their schooling in Canada.

A total of 93.9% of the 650 nurses who participated identified as registered nurses, while 4.5% were nurse practitioners. The remaining 1.6% identified as another type such as clinical nurse specialists. A total of 96.9% of nurses attended nursing school in Canada.

Statistical Analysis

All quantitative analyses were conducted using the Statistical Package for the Social Sciences (SPSS) 20.0 and included parametric (i.e., one-way ANOVAs, paired sample t tests) and non-parametric tests (i.e., Friedman test, Wilcoxon Signed Rank Tests, chi square). In analyses involving inferential statistics, a standard decision criterion of α=.05 was used. A Bonferroni correction was used in all follow-up pairwise comparisons.

The qualitative data were analyzed using inductive thematic analysis adhering to the procedures of Braun and Clarke (2006) and Firth and Gleeson (2004). Inductive thematic analysis allowed the analyst to make interpretations of the data rather than use the data to support previous theoretical conceptions, which is the case when using a deductive approach (Patton, 2002). The NVivo 9.2 software was used to manage all aspects of the thematic analysis in this study.

Results

Types of Patients

On average, participants reported spending 61.2% (*SD* = 36.73) of their workday providing direct patient care. Healthcare professionals were asked to indicate what percentage, if any, of their patients could be categorized into one of the following groups:

- Youth (10–24 years old);
- Adult (25–64 years old);
- Seniors (65+ years old);
- Patients with chronic pain;
- Patients with nonspecific symptoms;
- Patients with a substance abuse history; and
- Patients with a mental health diagnosis.

Responses were made using a four-point quartile rank scale using the categories of 1–25%, 26–50%, 51–75% and 76–100%. A "not applicable" option was also available for participants who did not have patients in those categories. As shown in Table 4, youth represented the lowest category of patients treated, whereas adults and seniors comprised the largest proportion of participants' patients. Patients with chronic pain, nonspecific symptoms, a history of substance abuse or a mental health diagnosis were found to be infrequently reported by the majority of healthcare professionals.

Table 4: Percentages of Types of Patients Cared for by Healthcare Professionals

Patient category	NA	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	22.4%	57.0%	14.3%	2.9%	3.5%
Adult (25–64 years old)	9.5%	16.5%	44.5%	23.9%	5.6%
Seniors (65+ years old)	12.3%	26.4%	26.7%	22.1%	12.5%
Patients with chronic pain	10.5%	54.5%	20.3%	11.1%	3.7%
Patients with nonspecific symptoms	16.0%	55.8%	18.1%	7.8%	2.3%
Patients with a substance abuse history	12.9%	62.1%	14.5%	7.0%	3.5%
Patients with a mental health diagnosis	9.5%	51.2%	22.5%	9.2%	7.6%

Estimated Rates of Prescribing Across Patient Categories

Using the four-point quartile rank categories, participants were asked to estimate the percentage of patients who were prescribed opioids, stimulants and sedatives or tranquillizers across the various patient categories. Inspection of Table 5 reveals that healthcare professionals estimated that opioids were infrequently prescribed to youth patients. In contrast, opioids were estimated to be most commonly prescribed among patients with chronic pain.

Table 5: Estimates of Percentages of Patients in Each Category Currently Prescribed Opioids

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	86.4%	6.4%	3.2%	4.0%
Adult (25–64 years old)	51.7%	28.2%	12.9%	7.2%
Seniors (65+ years old)	53.4%	26.3%	13.7%	6.6%
Patients with chronic pain	21.2%	22.1%	30.4%	26.2%
Patients with nonspecific symptoms	58.6%	23.8%	13.4%	4.1%
Patients with a substance abuse history	49.5%	25.7%	15.2%	9.6%
Patients with a mental health diagnosis	59.5%	23.4%	12.5%	4.7%

With respect to prescription stimulants, the data in Table 6 show that between 39.4% and 43.7% of healthcare professionals estimated that they did not have any youth or senior patients, or patients with chronic pain, nonspecific symptoms or a substance abuse history who were currently prescribed this category of drug. Of those healthcare professionals with patients currently prescribed stimulants, most (80.6–87.5%) indicated that they had approximately 1% to 25% of patients with such a prescription.

Table 6: Estimates of Percentages of Patients in Each Category Currently Prescribed Stimulants

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	85.9%	10.5%	3.1%	0.1%
Adult (25–64 years old)	85.9%	11.9%	2.1%	0.1%
Seniors (65+ years old)	87.5%	10.4%	2.1%	0.0%
Patients with chronic pain	82.5%	13.2%	3.1%	1.2%
Patients with nonspecific symptoms	85.0%	12.0%	2.7%	0.4%
Patients with a substance abuse history	80.6%	13.5%	4.4%	1.5%
Patients with a mental health diagnosis	72.3%	18.6%	6.7%	2.4%

Finally, the data presented in Table 7 show that healthcare professionals estimated that sedatives or tranquillizers were more commonly prescribed among seniors and patients with chronic pain or a mental health diagnosis.

Table 7: Estimates of Percentages of Patients in Each Category Currently Prescribed Sedatives or Tranquillizers

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	88.1%	8.5%	2.5%	1.0%
Adult (25–64 years old)	47.1%	36.0%	12.5%	4.4%
Seniors (65+ years old)	34.0%	31.1%	24.3%	10.5%
Patients with chronic pain	30.8%	31.5%	26.8%	10.8%
Patients with nonspecific symptoms	48.7%	29.4%	16.9%	4.9%
Patients with a substance abuse history	42.9%	27.8%	18.4%	10.9%
Patients with a mental health diagnosis	31.6%	27.5%	23.8%	17.1%

Extent of Known Cases of PDM

When asked to estimate the percentage of their patients they knew to be misusing their prescription medication, most healthcare professionals (76.5–87.7%) knew of only a small range of youth, adult and senior patients (i.e., 1% to 25%) who were misusing opioids (Table 8). In contrast, participants were more aware of a higher range (26% to 50%) of opioid misuse among patients with a history of substance abuse, nonspecific symptoms, chronic pain, , or a mental health diagnosis.

Table 8: Estimates of Percentages of Patients in Each Category Known to Misuse Opioids

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	87.7%	8.7%	2.5%	1.0%
Adult (25–64 years old)	76.5%	17.4%	4.8%	1.3%
Seniors (65+ years old)	81.6%	13.1%	4.9%	0.5%
Patients with chronic pain	61.5%	20.5%	13.5%	4.5%
Patients with nonspecific symptoms	67.8%	21.2%	8.4%	2.7%
Patients with a substance abuse history	51.2%	24.0%	14.8%	10.0%
Patients with a mental health diagnosis	66.4%	19.2%	11.4%	3.1%

In reviewing the data related to prescription stimulants (Table 9), most of the healthcare professionals (68.7–90.2%) reported that known stimulant misuse is infrequent across all categories of their patients.

Table 9: Percentages of Patients in Each Category Known to be Misusing Stimulants

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	86.5%	9.9%	2.8%	0.7%
Adult (25–64 years old)	84.9%	11.0%	4.0%	0.2%
Seniors (65+ years old)	90.2%	7.4%	2.2%	0.2%
Patients with chronic pain	80.9%	13.5%	4.9%	0.6%
Patients with nonspecific symptoms	82.7%	11.8%	4.9%	0.7%
Patients with a substance abuse history	68.7%	17.9%	9.1%	4.3%
Patients with a mental health diagnosis	77.9%	13.3%	6.5%	2.3%

As shown in Table 10, healthcare professionals reported knowing about instances of sedative or tranquillizer misuse in a greater percentage (i.e., 26% to 50%) of patients across all categories except youth. A number of participants (10.4–12.7%) reported knowing about its misuse in as many as 51% to 75% of patients with a history of substance abuse, mental health diagnosis, or chronic pain.

Table 10: Percentages of Patients in Each Category Known to be Misusing Sedatives or Tranquillizers

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	88.0%	8.7%	2.6%	0.7%
Adult (25–64 years old)	70.1%	21.8%	7.0%	1.1%
Seniors (65+ years old)	69.8%	19.7%	9.1%	1.4%
Patients with chronic pain	60.4%	25.0%	10.4%	4.1%
Patients with nonspecific symptoms	68.0%	20.8%	7.7%	3.4%
Patients with a substance abuse history	57.5%	21.9%	12.7%	7.9%
Patients with a mental health diagnosis	64.2%	19.7%	11.9%	4.2%

Extent of Suspected PDM

When asked to estimate the percentage of their patients they suspected were misusing their prescription medications, healthcare professionals indicated that opioid misuse was suspected to be more frequent among patients suffering with a history of substance abuse, chronic pain, those with nonspecific symptoms, or a mental health diagnosis (Table 11).

Table 11: Percentages of Patients in Each Category Suspected of Misusing Opioids

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	82.2%	13.8%	2.4%	1.6%
Adult (25–64 years old)	68.0%	23.3%	6.8%	1.9%
Seniors (65+ years old)	75.1%	16.8%	6.8%	1.3%
Patients with chronic pain	51.4%	27.0%	13.1%	8.5%
Patients with nonspecific symptoms	60.6%	24.0%	9.8%	5.7%
Patients with a substance abuse history	46.1%	25.1%	15.6%	13.2%
Patients with a mental health diagnosis	62.6%	20.9%	12.1%	4.4%

With respect to suspected cases of stimulant misuse, the data appeared consistent across patient categories, indicating that most healthcare professionals suspected that only a small range (i.e., 1% to 25%) of their patients were currently misusing stimulants (Table 12).

Table 12: Percentages of Patients in Each Category Suspected of Misusing Stimulants

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	80.2%	15.2%	3.8%	0.8%
Adult (25–64 years old)	79.0%	14.7%	4.6%	1.6%
Seniors (65+ years old)	86.8%	8.8%	3.6%	0.8%
Patients with chronic pain	77.2%	14.3%	5.6%	2.8%
Patients with nonspecific symptoms	76.0%	16.3%	5.3%	2.5%
Patients with a substance abuse history	62.2%	20.8%	9.6%	7.3%
Patients with a mental health diagnosis	70.3%	17.9%	7.7%	4.1%

As shown in Table 13, 22.3–26.2% of participants consistently reported that suspected cases of sedative or tranquillizer misuse among their patients was in the range of 26% to 50% across all patient categories except youth. Between 9.5% and 12.9% of healthcare professionals suspected that current rates of misuse of these drugs are as high as 51% to 75% of all categories of patients, except youth.

Table 13: Percentages of Patients in Each Category Suspected of Misusing Sedatives or Tranquillizers

Patient category	1–25%	26–50%	51–75%	76–100%
Youth (10–24 years old)	83.7%	11.9%	3.4%	0.9%
Adult (25–64 years old)	64.6%	22.3%	10.6%	2.5%
Seniors (65+ years old)	61.5%	24.3%	9.5%	4.7%
Patients with chronic pain	55.7%	26.2%	11.0%	7.1%
Patients with nonspecific symptoms	61.6%	23.3%	9.8%	5.3%
Patients with a substance abuse history	48.8%	26.1%	12.9%	12.1%
Patients with a mental health diagnosis	57.9%	23.8%	11.8%	6.5%

To investigate whether healthcare professionals suspected that certain categories of patients misused one drug category over another, a series of Friedman analyses was conducted to compare the frequencies of suspected PDM within each participant category. These were followed up by Wilcoxon Signed Rank Tests where appropriate to determine specifically which prescription drug category (opioids vs. stimulants vs. sedatives) healthcare providers viewed as being more or less prevalent among the patient group. Figure 1 displays the percentage of youth patients suspected of misusing the three categories of drugs. Results revealed no significant differences in the mean ranks among percentages of youth suspected of misusing opioids (M_{rank} = 2.00), stimulants (M_{rank} = 2.03), and sedatives or tranquillizers (M_{rank} = 1.97), χ^2 (2, N = 461) = 4.67, p = .097, indicating that youth were not suspected to misuse any one class of prescription drug more than another.

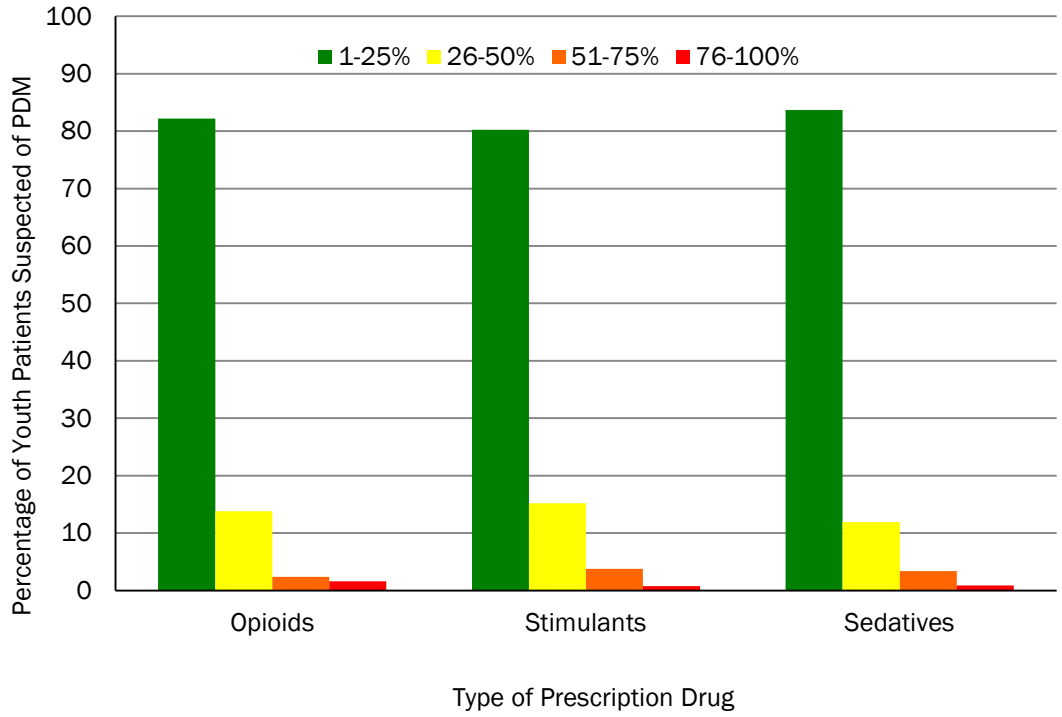

Figure 1: Percentages of Youth Patients Suspected of PDM

In terms of adult patients, significant differences in the mean rank percentages of patients suspected of misusing opioids (M_{rank} = 2.07), stimulants (M_{rank} = 1.79) and sedatives or tranquillizers (M_{rank} = 2.14) were found, χ^2 (2, N = 650) = 145.11, p < .001. Adults were suspected of misusing sedatives or tranquillizers more than stimulants (z = -10.25, p < .001) and opioids (z = -2.91, p = .004). Additionally, opioids were suspected of misuse more than stimulants (z = 8.63, p < .001) (Figure 2).

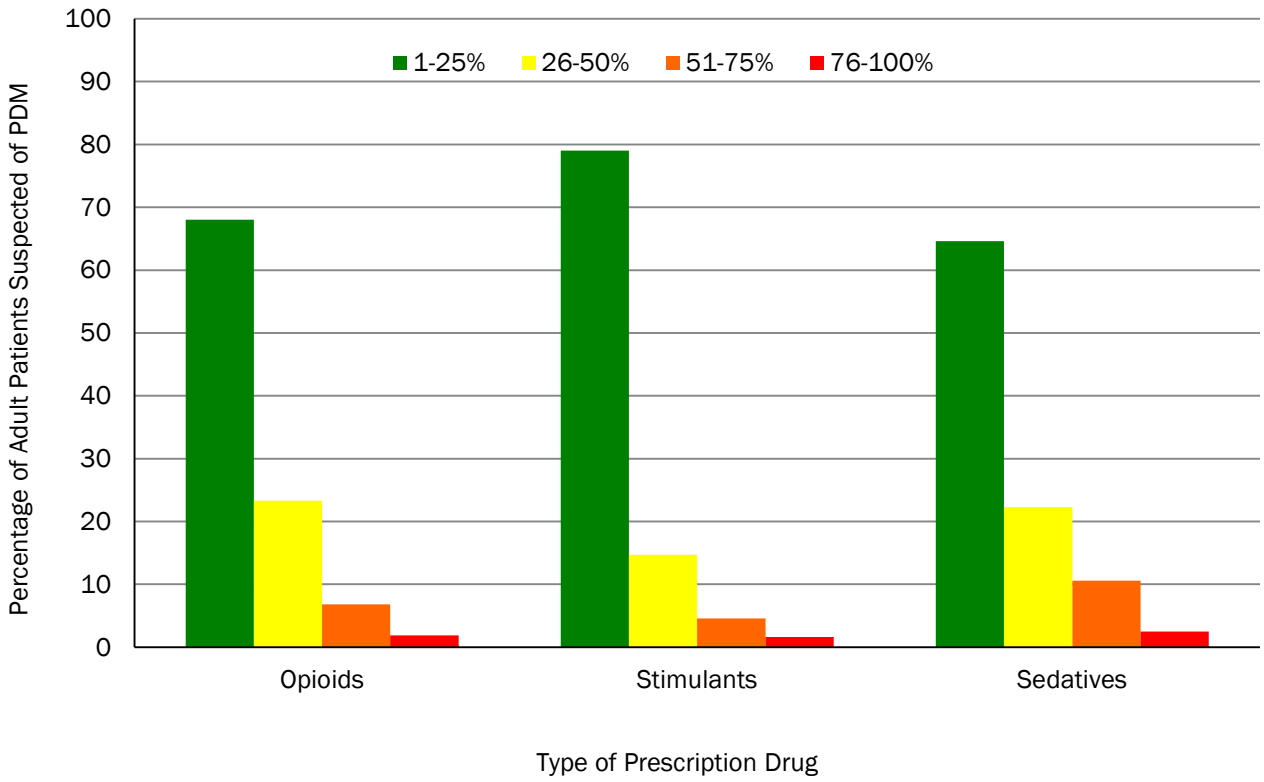

Figure 2: Percentages of Adult Patients Suspected of PDM

Significant differences in the mean rank percentages of senior patients suspected of misusing opioids (M_{rank} = 1.98), stimulants (M_{rank} = 1.74), and sedatives or tranquillizers (M_{rank} = 1.68) were found, χ^2 (2, N = 487) = 206.44, p < .001. Specifically, seniors were suspected of misusing sedatives or tranquillizers more than stimulants (z = -11.59, p < .001) and opioids (z = -9.26, p < .001). Additionally, opioids were suspected of misuse more than stimulants (z = -7.84, p < .001; Figure 3).

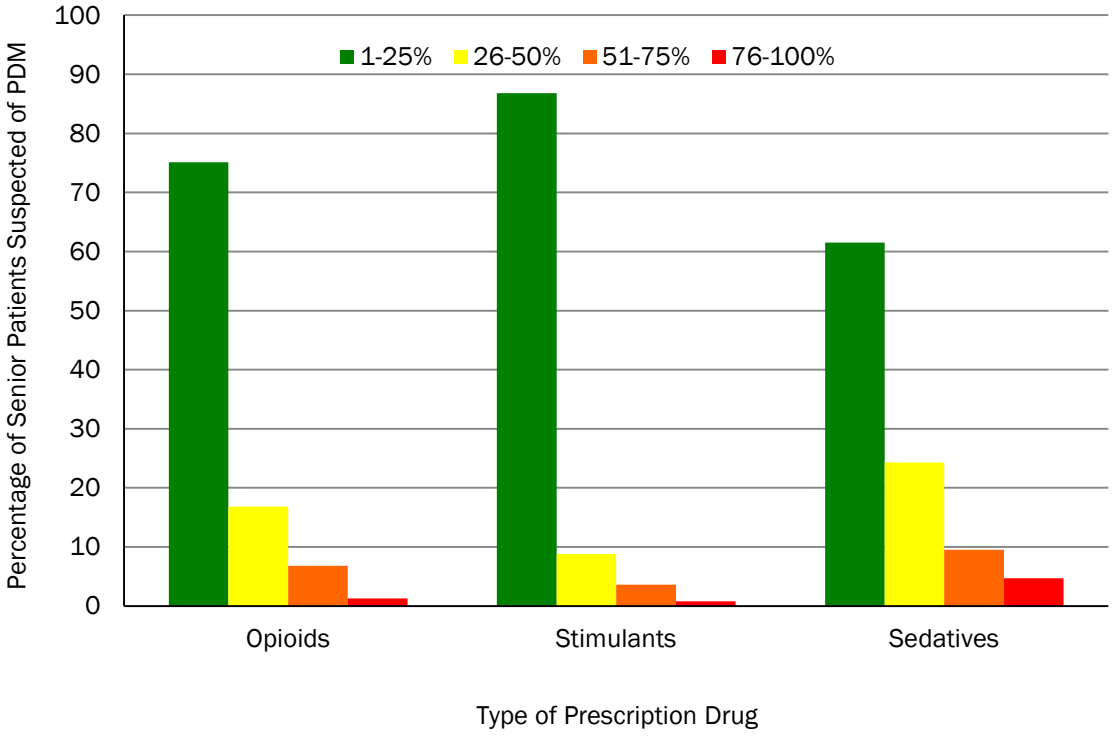

Figure 3: Percentages of Senior Patients Suspected of PDM

Analyses of suspected PDM misuse among patients with chronic pain revealed significant differences in the mean rank percentages of misusing opioids (M_{rank} = 1.95), stimulants (M_{rank} = 1.34), and sedatives or tranquillizers (M_{rank} = 1.83), χ^2 (2, N = 549) = 302.72, p < .001. Participants were more likely to suspect that patients with chronic pain misused opioids than stimulants (z = -13.54, p < .001) and sedatives or tranquillizers (z = -4.94, p < .001). Sedatives or tranquillizers were also suspected to be misused more than stimulants (z = -12.48, p < .001; Figure 4).

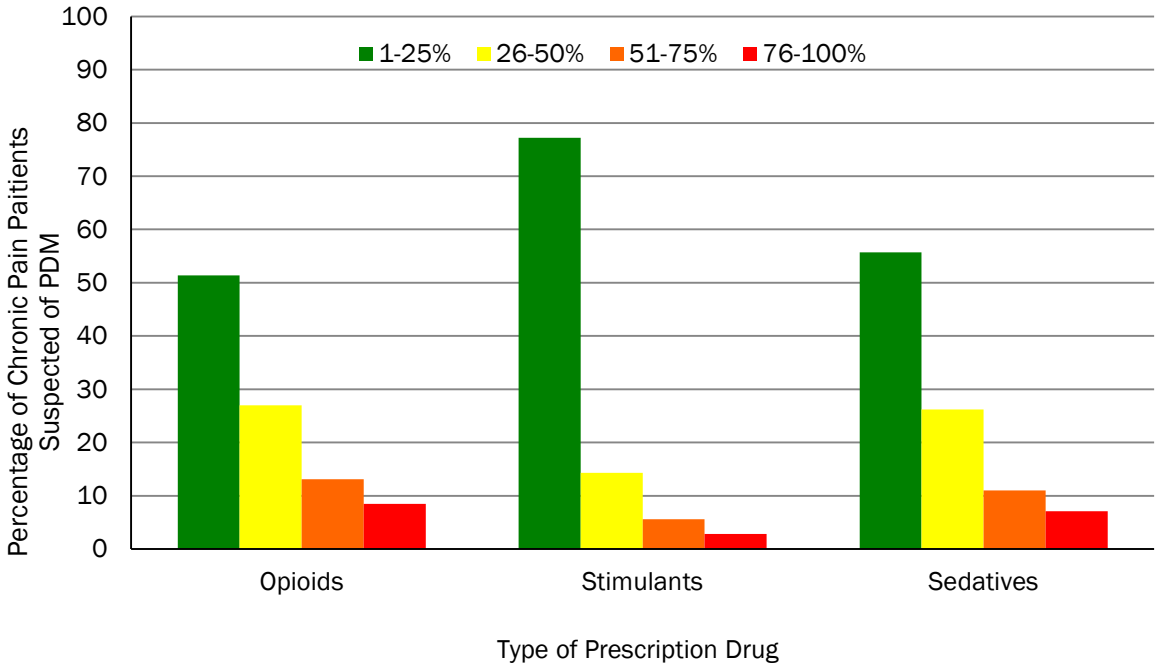

Figure 4: Percentages of Patients with Chronic Pain Suspected of PDM

Investigating healthcare professionals' suspicion of misuse among patients with nonspecific symptoms revealed significant differences in the mean rank percentages of misusing opioids (M_{rank} = 1.70), stimulants (M_{rank} = 1.35), and sedatives or tranquillizers (M_{rank} = 1.67), χ^2 (2, N = 533) = 146.84, p < .001. Participants were more likely to suspect patients with nonspecific symptoms to misuse opioids than stimulants (z = -9.69, p < .001) and sedatives or tranquillizers were suspected of misuse more than stimulants (z = -9.51, p < .001). There was no difference found between rates of suspected opioid misuse and sedatives or tranquillizers (z = -1.16, p = .248; Figure 5).

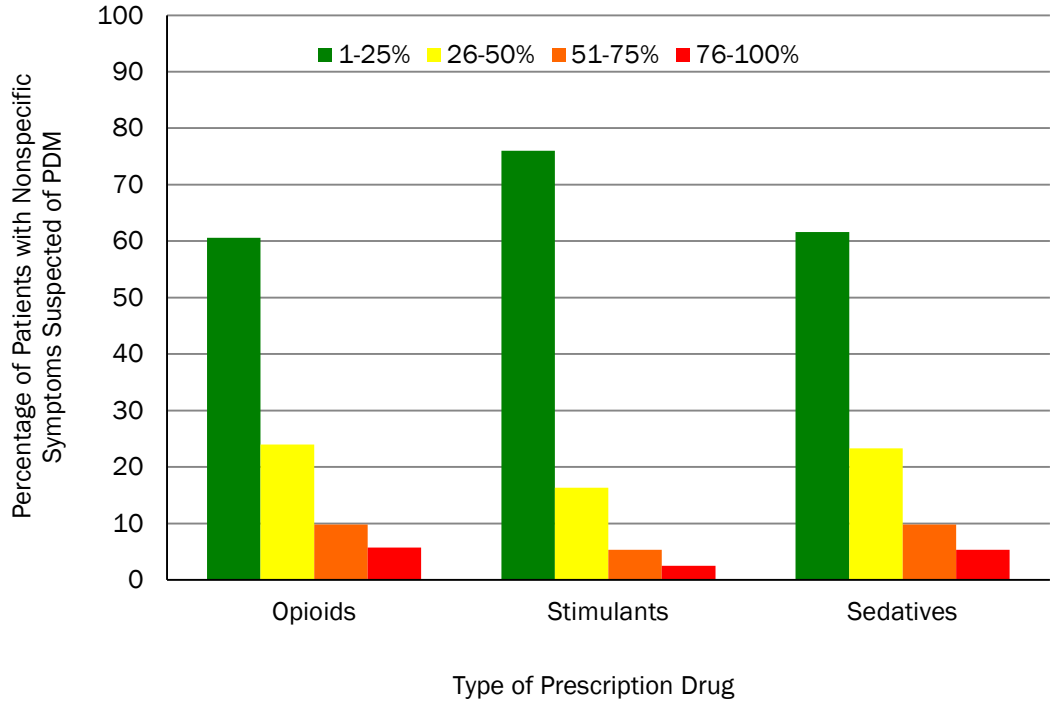

Figure 5: Percentages of Patients with Nonspecific Symptoms Suspected of PDM

Analyses of suspected misuse among patients with a history of substance abuse revealed significant differences in the mean rank percentages of misusing opioids (M_{rank} = 2.20), stimulants (M_{rank} = 1.72), and sedatives or tranquillizers (M_{rank} = 2.07), χ^2 (2, N = 621) = 218.61, p < .001. Participants were more likely to suspect patients with a substance abuse history to misuse opioids more than stimulants (z = -12.21, p < .001) and sedatives (z = -4.90, p < .001). Additionally, sedatives were suspected of misuse more than stimulants (z = -10.36, p < .001; Figure 6).

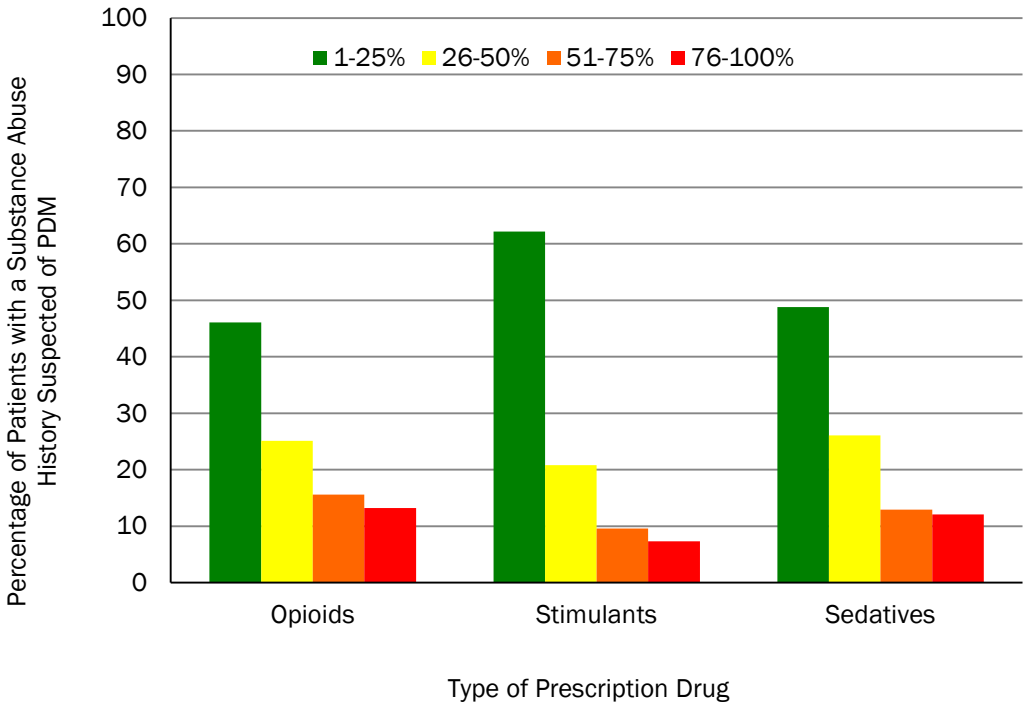

Figure 6: Percentages of Patients with a Substance Abuse History Suspected of PDM

Analyses of suspected misuse among patients with a mental health diagnosis found significant differences in the mean rank percentages of misusing opioids (M_{rank} = 2.03), stimulants (M_{rank} = 1.80), and sedatives or tranquillizers (M_{rank} = 2.17), χ^2 (2, N = 567) = 121.54, p < .001. Healthcare professionals were more likely to suspect patients with a mental health diagnosis to misuse sedatives or tranquillizers more than opioids (z = -4.26, p < .001) and stimulants (z = -9.76, p < .001). Opioids were suspected of misuse more than stimulants (z = -6.71, p < .001; Figure 7).

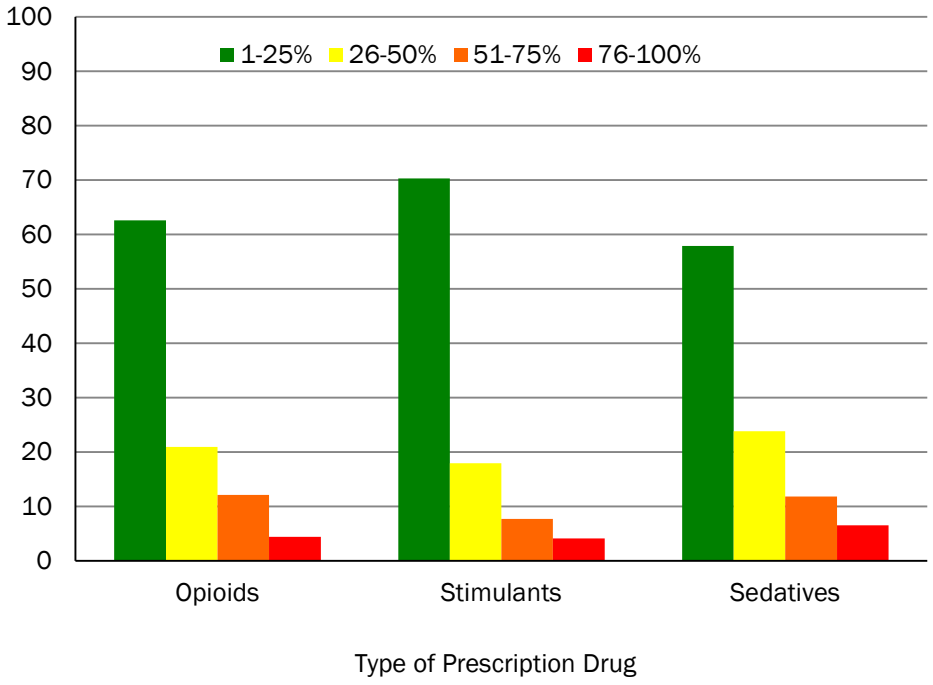

Figure 7: Percentages of Patients with a Mental Health Diagnosis Suspected of PDM

Clinical Presentation of PDM

Participants were provided a list of 21 behaviours and asked to rate each one on the degree to which it indicated PDM, using a scale from 1 (*not at all*) to 7 (*definitely*). Table 14 provides the entire list of behaviours and mean and standard deviation ratings across all participants and the participant groups. For brevity, the names of the behaviours have been shortened. The behaviours have been sorted in descending order according to the overall group mean.

Table 14: Mean and Standard Deviation Ratings of Clinical Indicators of PDM

Behaviour[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Altering delivery of medication	5.48 (1.39)	5.54 (1.39)	5.18 (1.70)	5.69 (1.13)	5.45 (1.40)	Pharmacists rated higher than dentists (p = .013)
Prescription forgeries	5.47 (1.40)	5.72 (1.02)	5.39 (1.57)	5.71 (1.01)	5.37 (1.52)	Pharmacists rated higher than nurses (p = .018)
Double doctoring	5.22 (1.32)	5.37 (1.04)	5.11 (1.46)	5.47 (0.98)	5.13 (1.41)	Pharmacists rated higher than nurses (p = .011)
Doctor shopping	5.18 (1.31)	5.39 (1.06)	5.22 (1.40)	5.45 (1.03)	5.06 (1.39)	Pharmacists rated higher than nurses (p = .001)
Family or caregiver expresses worry	4.88 (1.29)	4.96 (1.21)	4.77 (1.66)	4.86 (1.19)	4.89 (1.26)	N/A
Patient's use of medication is different than prescribed	4.76 (1.34)	4.98 (1.25)	4.70 (1.44)	4.59 (1.22)	4.79 (1.36)	N/A
Request replacement for lost or stolen medication	4.56 (1.44)	5.03 (1.17)	4.52 (1.57)	4.96 (1.03)	4.37 (1.52)	Nurses rated lower than physicians (p < .001) and pharmacists (p < .001)
Requesting that opioid, stimulant or sedative medication NOT be billed through patient's routine insurance plan	4.54 (1.66)	4.40 (1.87)	4.59 (1.70)	5.32 (1.10)	4.30 (1.70)	Pharmacists rated higher than physicians (p < .001), dentists (p = .001) and nurses (p < .001)
Only requesting the opioid, stimulant or sedative portion of a prescription to be filled	4.40 (1.58)	4.52 (1.55)	4.64 (1.62)	4.84 (1.24)	4.20 (1.63)	Nurses rated lower than dentists (p = .037) and pharmacists (p < .001)
Come in early to refill prescription	4.37 (1.59)	4.80 (1.28)	4.15 (1.75)	4.94 (1.07)	4.16 (1.68)	Physicians rated higher than dentists (p = .017) and nurses (p = .001); pharmacists rated higher than dentists (p < .001) and nurses (p < .001)
Request specific drugs	4.27 (1.47)	4.51 (1.28)	4.59 (1.43)	4.36 (1.43)	4.15 (1.51)	Dentists rated higher than nurses (p = .026)
Frequent visits to prescribers	4.21 (1.84)	4.27 (1.35)	4.51 (1.48)	3.92 (1.40)	4.24 (1.52)	Pharmacists rated lower than dentists (p = .004) and nurses (p = .037)
Change reasons for returning to prescriber	4.20 (1.54)	4.34 (1.45)	4.30 (1.51)	4.12 (1.46)	4.19 (1.58)	N/A

Behaviour[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Disproportionate pain/disability for presenting problem	4.18 (1.45)	4.49 (1.29)	4.33 (1.41)	4.02 (1.35)	4.15 (1.50)	Physicians rated higher than pharmacists (p = .045)
Appear intoxicated	4.18 (1.46)	4.59 (1.35)	3.95 (1.48)	4.40 (1.35)	4.08 (1.49)	Physicians rated higher than dentists (p = .008) and nurses (p = .007). Pharmacists rated higher than nurses (p = .043)
Lack of improved function	4.16 (1.49)	4.39 (1.43)	4.01 (1.58)	4.02 (1.36)	4.19 (1.51)	N/A
Resistant to switch to another medication	3.87 (1.51)	4.31 (1.33)	3.74 (1.62)	3.86 (1.42)	3.83 (1.53)	Physicians rated higher than dentists (p = .034), nurses (p = .017) and pharmacists (p = .079)
Hoarding medication	3.73 (1.65)	3.78 (1.63)	3.51 (1.72)	3.73 (1.50)	3.75 (1.69)	N/A
Request medication dispensed in original/sealed manufacturer's container	3.04 (1.51)	3.11 (2.12)	2.75 (2.01)	4.23 (1.77)	2.72 (1.97)	Pharmacists rated higher than physicians (p = .004), dentists (p < .001) and nurses (p < .001)
Request "brand only" be dispensed	2.81 (1.89)	3.19 (1.91)	2.38 (1.85)	3.94 (1.65)	2.47 (1.81)	Pharmacists rated higher than physicians (p = .004), dentists (p < .001) and nurses (p < .001); physicians rated higher than dentists (p = .006) and nurses (p < .004)
Request dispensing of a smaller quantity than prescribed	1.88 (1.70)	2.09 (1.71)	1.97 (1.78)	2.02 (1.73)	1.79 (1.67)	N/A

[1]The behaviours have been sorted in descending order according to the overall group mean.

[2] Follow-up pairwise comparisons were conducted only on individual groups, after finding a significant group effect (see Table B.1 in Appendix B). All comparisons were controlled using a Bonferroni correction to control for Type I error.

Behaviours that were rated highly by participants as indicators of PDM include altering the delivery method of the medication and engaging in a criminal offense by directly forging a prescription (Table 14). While some drug-seeking behaviours, such as double doctoring and doctor shopping, were rated highly, others, such as frequently visiting prescribers and over-representing pain symptoms, were rated on average closer to the middle of the scale. Behaviours such as requesting a prescription drug to be dispensed in smaller quantities than prescribed and requesting only brand-name prescriptions received the lowest ratings, on average.

A series of separate one-way ANOVAs was conducted to identify possible differences among the healthcare professional groups' perceptions on all the behaviours (see Table B.1 in Appendix B for the results of those analyses). Considering the four highest rated behaviours in Table 14, a significant difference among the groups was found with respect to altering the delivery of medication. Follow-up pairwise comparisons revealed that pharmacists rated this behaviour as an indicator of PDM more highly than dentists. Pharmacists were also found to rate several behaviours higher than nurses, including prescription forgeries, double doctoring and doctor shopping.

In examining the three lowest rated behaviours in Table 14, a significant difference was observed for requesting medication dispensed in the original manufacturer's packaging. Pharmacists were found to rate this behaviour as an indicator of PDM significantly higher than physicians, dentists and nurses. A significant difference was also noted for requesting a brand-only medication to be dispensed, with pharmacists rating this behaviour higher than physicians, dentists and nurses. Physicians were also found to rate this behaviour higher than dentists and nurses.

Clinical Presentations of PDM: Qualitative Findings

Participants were also asked an open-ended question about other patient behaviours they believed to be associated with PDM. A total of 574 participants provided a response. The following subsections describe the themes that were identified from thematic analysis.

Aggression and Intimidation

One of the most common themes that emerged from participants' responses was patients' use of anger or intimidation in response to a healthcare professional not providing a prescription. For example, one nurse reported a patient "getting angry if the physician does not give a prescription for the exact drug she chooses." A pharmacist stated, "aggressive/demanding behaviour [by the patient] if medication [is] not in stock in pharmacy." A physician wrote that a patient "threaten[ed] to call the College of Physicians & Surgeons to report that a prescriber doesn't care or doesn't treat pain appropriately."

Demanding a Specific Medication

Many participants wrote that a patient stating that he or she required a specific type or brand of prescription is an indicator of PDM. For example, one physician stated, "they specifically know the name of and request [a] drug." Participants also described that patients rationalized why they required the specific prescription drug in question. Oftentimes, patients were described as stating they had allergies to alternatives. For example, one nurse wrote that patients had "long lists of allergies with the exception of one or two drugs." A pharmacist wrote that such patients would state, "they are severely allergic to all opioids except the one they are requesting."

Patients Refuse To Consider Alternatives to Prescription Drugs

Participants identified patient refusal to consider or accept alternative forms of treatment as an indicator of PDM. Within this theme, participants indicated that patients would not consider other treatments that had the potential to help. For example, one nurse wrote that patients would "refuse to seek counselling or alternative therapies, i.e., physiotherapy." Other participants identified that the patient refused the underlying problem to be treated, which would address the symptoms. For example, a dentist described a situation where a patient "won't have a grossly decayed tooth removed and requests narcotics instead and usually has some story about just needing something to get them by for a few days until they can get back to their regular dentist."

Health Professional Shopping

A number of participants provided clear examples of health professional shopping that included patients using the emergency room when they had a family physician or waiting for nurses to change shifts so they could ask for a new nurse. One pharmacist describing health professional shopping wrote that he or she could see "evidence [that] multiple pharmacies [had been] used on Netcare."

Vague Symptoms and Medical History

Patients presenting with vague symptoms or being unclear about their medical history appeared to raise participants' suspicion. Specific to symptoms, a nurse wrote that patients might say, "pain is nondescript and location changes often." With respect to vague medical history, a nurse wrote that patients claimed they "can't remember history/when/where seen last, family GP's name," while a physician provided the example of patients who "cannot name the prescription drug or the reason why it was prescribed."

Patients Talking Too Much

Interestingly, some participants made reference to patients who talked too much as indicators of PDM. For example, one nurse was given "lengthy explanations for need for change in prescription." A physician cited, "excessively friendly," while a pharmacist reported, "overly talkative about meds." It appeared that the issue at play in these accounts of indicators of PDM is that excessive talking was viewed as a method of manipulation. In other words, patients were perceived to use talking to distract the healthcare professional. For example, a pharmacist experienced "long story telling/explanations of why [they] need drug or trying to engage in conversation to distract from the prescription." A physician wrote, "talking about other things to distract physician so they will fill rx."

Patient's Self-report vs. Symptoms

Inconsistency in a patient's self-report and his or her physical symptoms were described as indicative of potential PDM. The examples provided were specifically in reference to reporting pain. For example, a physician wrote, "rating pain level to be 10/10 as in severe, but VS [vital signs] are normal and patient appears to be comfortable." A nurse wrote, "rating their pain 10/10 all the time. Also their pain doesn't get any better."

Clinical Presentations of PDM: Discussing PDM with Patients

Overall, 66.8% of participants indicated that they had previously discussed PDM with their patients or taken other measures to address the issue. A significant association was found among responses and participant groups, χ^2 (3, N = 1049) = 74.94, p < .001. Interestingly, a greater number of

physicians and pharmacists indicated they had discussed or taken measures to address patient PDM than would be statistically expected given the overall distribution of responses, whereas fewer dentists and nurses than expected indicated doing so.

Healthcare professionals were also asked in an open-ended question to describe what they did to manage or address PDM in their patients. A total of 660 participants responded to this question and three main themes were identified from their responses, outlined below.

Developing a Contract

Participants identified how they have worked with patients in an attempt to manage and address their PDM through the development of a patient-healthcare professional contract. Often, these contracts were used to address drug-seeking behaviour by addressing the number of healthcare professionals to be involved in the patient's care. For example, one physician cited the example of making a "contract with [a] patient for 1 doctor [and] 1 pharmacy of their choice." Other participants indicated that the contract focused on how prescription medication was to be used, such as "sign[ing] a contract for appropriate use," as cited by a nurse. Examples were also provided in which a contract was developed between healthcare professionals. For example, a nurse stated that he or she "worked with pharmacist to monitor use contract with patient and dispensed limited amount from the pharmacy."

Talking it Over

Many participants described that they talk to the patient. In some cases, the discussion focused on education. In other cases, participants talked to the patient to confront him or her about PDM. One physician wrote, "I have confronted malingerers and patients who have been double doctoring or losing the medications." Another nurse described using the direct approach with young people and specifically asking them, "Do you take this medication as prescribed?" Other participants described talking to patients to discuss inconsistencies in their stories and behaviours.

Alternative Methods

Many participants responded that they recommended alternative methods to deal with the patient's issues. These alternatives were said to include different types of drugs or an alternative non-drug solution. For example, patients were directed to pain clinics. One nurse wrote, "due to uncontrolled pain suggested pain clinic referral." Other participants described recommending counselling, as one pharmacist wrote, "ask if they have tried alternative therapies such as psychological counselling." In reference to non-drug alternatives, another pharmacist wrote that he or she "provided info on non-drug insomnia interventions."

PDM Risk Factors

Overall, participants agreed with the statement that PDM risk factors are too difficult or impossible to characterize (1 [*agree*] to 7 [*disagree*]) (M = 2.56, SD = 1.47). There were no significant differences across the various healthcare professional groups (see Table B.2 for results of the one-way ANOVA).

Using a scale from 1 (*not at all*) to 7 (*definitely*), participants were asked to separately rate 15 potential risk factors on the degree to which they are indicative of PDM. Table 15 provides the entire list of risk factors and their mean and standard deviation ratings across participants and the individual participant groups. Considering the range of the scale, the data demonstrate that participants agreed that all of the items constitute PDM risk factors. Two items, history of substance abuse and recent or active illicit drug abuse, were both rated highly. Three of the seven patient

categories (i.e., senior, youth and adult) were rated the lowest of the items on the list. However, it is still important to note that their mean ratings indicated that participants considered them to be risk factors. The three remaining patient categories (i.e., patients with chronic pain, nonspecific symptoms and mental health diagnoses) were all found to have high ratings.

Table 15: Mean and Standard Deviation Ratings of Potential PDM Risk Factors

Risk factor[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
History of substance abuse	6.58 (0.77)	6.69 (0.71)	6.65 (0.71)	6.73 (0.53)	6.51 (0.85)	Pharmacists rated higher than nurses (p = .003)
Recent or active illicit drug use	6.50 (0.83)	6.64 (0.66)	6.51 (0.80)	6.57 (0.72)	6.45 (0.89)	N/A
Suicidal ideation	5.95 (1.21)	5.65 (1.30)	5.98 (1.15)	5.90 (1.23)	6.01 (1.20)	Nurses rated higher than physicians (p = .034)
Chronic pain	5.76 (1.23)	5.72 (1.20)	5.60 (1.31)	5.51 (1.25)	5.87 (1.20)	Nurses rated higher than pharmacists (p = .001)
Recent or active alcohol use	5.74 (1.29)	5.58 (1.27)	5.69 (1.21)	5.82 (1.22)	5.70 (1.33)	N/A
Psychiatric disorders (e.g., depression, anxiety, PTSD)	5.73 (1.34)	5.62 (1.33)	5.70 (1.33)	5.71 (1.22)	5.75 (1.38)	N/A
History of sexual abuse	5.49 (1.37)	5.57 (1.24)	5.13 (1.44)	5.37 (1.37)	5.58 (1.37)	Nurses rated higher than dentists (p = .008)
Chronic medical conditions or diseases	5.28 (1.41)	4.91 (1.66)	5.33 (1.29)	4.71 (1.42)	5.50 (1.35)	Nurses rated higher than physicians (p < .001) and pharmacists (p < .001); dentists rated higher than pharmacists (p = .001)
Cognitive impairment	5.22 (1.53)	5.09 (1.60)	4.84 (1.50)	5.00 (1.37)	5.38 (1.56)	Nurses rated higher than dentists (p = .003) and pharmacists (p = .010)
Nonspecific symptoms	4.86 (1.52)	5.14 (1.55)	4.88 (1.34)	4.37 (1.67)	4.97 (1.47)	Pharmacists rated lower than physicians (p < .001), dentists (p = .023) and nurses (p < .001)
Adult (25–64 years old)	4.22 (1.60)	4.35 (1.46)	3.89 (1.54)	3.98 (1.49)	4.33 (1.65)	Nurses rated higher than dentists (p = .047) and pharmacists (p = .037)
Youth (10–24 years old)	4.18 (1.64)	4.46 (1.43)	3.97 (1.67)	3.90 (1.45)	4.26 (1.71)	Pharmacists rated lower than physicians (p = .034) and nurses (p = .045)
Senior (65 + years old)	4.15 (1.64)	4.15 (1.56)	3.41 (1.44)	3.76 (1.40)	4.39 (1.70)	Physicians rated higher than dentists (p = .005); nurses rated higher than dentists (p < .001) and pharmacists (p < .001)
Male	3.92 (1.78)	4.16 (1.57)	3.57 (1.72)	3.64 (1.64)	4.03 (1.84)	Nurses rated higher than pharmacists (p = .039)

Risk factor[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Female	3.85 (1.79)	4.06 (1.61)	3.45 (1.67)	3.43 (1.58)	4.02 (1.86)	Physicians rated higher than pharmacists (p = .024); nurses rated higher than dentists (p = .011) and pharmacists (p = .039)

[1] The risk factors have been sorted in descending order according to the overall group mean.

[2] Follow-up pairwise comparisons were conducted only on individual groups, after finding a significant group effect (see Table B.3 in Appendix B). All comparisons were controlled using a Bonferroni correction to control for Type I error.

A series of one-way ANOVAs were conducted to determine if differences existed among the healthcare provider groups on perceptions of the potential risk for certain patient group characteristics(see Table B.3 in Appendix B for the results of these analyses). There was a significant group effect on ratings of history of substance abuse, with pharmacists rating this risk factor higher than nurses. A significant group effect was also found among ratings of the chronic pain risk factor, with nurses rating this risk factor higher than pharmacists. Likewise,differences were observed among the mean ratings of the adult risk factor, with nurses rating this risk factor higher than dentists and pharmacists. Also,the mean ratings of being a youth patient as a risk factor, were significantly higher for physicians and nurses compared topharmacists. Finally, the mean ratings of being a senior patient as a risk factor; revealed that physicians rated this risk factor significantly higher than dentists, while nurses rated this risk factor higher than dentists and pharmacists.

Barriers to Identifying PDM

Using a scale from 1 (*not at all*) to 7 (*definitely*), participants were asked to rate 14 items on the degree to which they serve as barriers to identifying PDM in patients. The list of barriers and their mean ratings and standard deviations appear in Table 16. In general, all of the items received high ratings, meaning that they were strongly perceived as barriers by the surveyed healthcare professionals. Group differences were explored using a series of one-way ANOVAs; a summary of the significant differences across the individual participant groups appears in Table 16 (the full results of the ANOVAs and significant pairwise comparisons are presented in Table B.4 in Appendix B). Group differences were found on all of the perceived barriers, except *lack of patient honesty*.

Table 16: Mean and Standard Deviation Ratings of Potential Barriers to Identifying PDM

Barriers[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Lack of patient honesty	6.41 (0.98)	6.28 (1.22)	6.52 (0.91)	6.44 (0.92)	6.40 (0.96)	N/A
Lack of communication with patient	6.02 (1.37)	5.63 (1.79)	5.77 (1.41)	5.67 (1.47)	6.23 (1.21)	Nurses rated higher than physicians ($p < .001$), dentists ($p = .005$) and pharmacists ($p < .001$)
Insufficient time with patients	5.98 (1.27)	5.75 (1.18)	5.11 (1.63)	5.75 (1.29)	6.24 (1.12)	Dentists rated lower than physicians ($p = .001$), nurses ($p < .001$) and pharmacists ($p < .001$); nurses rated higher than physicians ($p = .001$) and pharmacists ($p < .001$)
Lack of communication with patient's other healthcare professionals	5.89 (1.27)	5.55 (1.46)	5.66 (1.21)	5.88 (1.15)	5.98 (1.27)	Nurses rated higher than physicians ($p = .010$)
Lack of access to chronic pain or addiction specialists	5.89 (1.35)	5.57 (1.81)	5.45 (1.33)	5.69 (1.30)	6.07 (1.25)	Nurses rated higher than physicians ($p = .003$), dentists ($p < .001$) and pharmacists ($p = .002$)
Reluctance to inquire about PDM with patients	5.67 (1.54)	4.62 (2.09)	5.38 (1.50)	5.57 (1.52)	5.91 (1.37)	Physicians rated lower than dentists ($p = .001$), nurses ($p < .001$) and pharmacists ($p < .001$); nurses rated higher than dentists ($p < .004$) and pharmacists ($p = .027$)
Uncertainty regarding reporting lines and who to advise if a patient is misusing	5.57 (1.51)	4.82 (1.93)	5.51 (1.40)	5.50 (1.56)	5.72 (1.41)	Physicians rated lower than dentists ($p = .005$), nurses ($p < .001$) and pharmacists ($p = .001$)
Lack of communication with patient's family	5.55 (1.39)	5.51 (1.39)	5.28 (1.48)	5.15 (1.50)	5.72 (1.30)	Nurses rated higher than dentists ($p = .010$) and pharmacists ($p < .001$)
Inadequate knowledge or training of practitioners	5.43 (1.53)	4.91 (1.82)	4.86 (1.73)	5.40 (1.47)	5.62 (1.43)	Nurses rated this higher than physicians ($p < .001$) and dentists ($p < .001$); pharmacists rated higher than dentists ($p = .015$)
Lack of communication with the patient's pharmacist	5.31 (1.70)	4.65 (1.91)	5.11 (1.58)	5.56 (1.58)	4.94 (1.86)	Nurses rate higher than physicians ($p < .001$) and pharmacists ($p < .001$)

Barriers[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Difficulty accessing provincial prescribing database	5.25 (1.83)	4.33 (2.28)	5.20 (1.62)	4.74 (2.04)	5.56 (1.62)	Nurses rated higher than physicians ($p < .001$) and pharmacists ($p < .001$); dentists rated higher than physicians ($p = .003$)
The symptoms of PDM are obscure or confusing	4.89 (1.59)	4.12 (1.90)	4.88 (1.51)	4.73 (1.52)	5.05 (1.53)	Physicians rated lower than dentists ($p = .003$), nurses ($p < .001$) and pharmacists ($p = .010$)
Availability of walk-in clinics	4.88 (1.73)	5.21 (1.70)	4.50 (1.62)	4.63 (1.83)	4.98 (1.71)	Physicians rated higher than dentists ($p = .018$) and pharmacists ($p = .036$); nurses rated higher than dentists ($p = .047$)
Use of emergency rooms	4.85 (1.67)	4.72 (1.69)	4.56 (1.59)	4.31 (1.65)	5.09 (1.65)	Nurses rated higher than dentists ($p = .010$) and pharmacists ($p < .001$)

[1] The barriers have been sorted in descending order according to the overall group mean.

[2] Follow-up pairwise comparisons were conducted only on individual groups, after finding a significant group effect (see Table B.4 in Appendix B). All comparisons were controlled using a Bonferroni correction to control for Type I error.

Because the survey also included a series of questions that were relevant only to specific healthcare professionals, question-branching was used. For example, only physicians were asked, using a scale from 1 (*not at all*) to 7 (*definitely*), the degree to which not being the initial diagnosing physician presents a barrier to identifying PDM. Physicians affirmatively identified this as a barrier (M = 5.15, SD = 1.66).

Dentists, nurses and pharmacists were asked the degree to which a lack of communication with the patient's physician presents a barrier to identifying PDM (1 [*not at all*] to 7 [*definitely*]). Overall, the three groups identified this as a barrier (M = 5.71, SD = 1.39). A one-way ANOVA showed a group effect, $F(2, 949) = 5.69$, $p = .003$, with follow-up pairwise comparisons revealing that nurses rated this barrier significantly higher than dentists ($p = .016$).

Strategies to Prevent and Address PDM

Participants were asked to rate how effective they thought they were in preventing and addressing PDM (1 [*not at all effective*] to 7 [*extremely effective*]), and overall, their mean ratings were in the middle of the scale (M = 3.62, SD = 1.46). When group differences were explored, a one-way ANOVA identified a group effect, $F(3, 1044) = 20.28$, $p < .001$, with nurses (M = 3.38, SD = 1.42) rating themselves as less effective compared to the ratings of physicians (M = 4.42, SD = 1.36; $p < .001$), dentists (M = 4.00, SD = 1.70; $p < .001$) and pharmacists (M = 3.79, SD = 1.29; $p = .002$). Pharmacists' ratings were also found to be lower than the ratings of physicians ($p = .002$).

Only 25.8% of participants felt they had adequate support for preventing and addressing PDM. When comparing the participant groups, a significant association was found, χ^2 (3, N = 1043) = 8.79, p = .032, with fewer nurses and pharmacists and more physicians and dentists answering affirmatively to this question than expected given the overall distribution of responses. Participants who responded "yes" were asked to rate, on a scale from 1 (*not at all effective*) to 7 (*extremely effective*), how effective their current level of support was in preventing and addressing PDM. Overall, the support was considered marginally effective (M = 4.12, SD = 1.52), with no group differences found.

When asked about non-drug options available for patients suspected of misusing prescription drugs, 60.5% of participants indicated that they did not feel they had non-drug options to provide patients that might be equally effective in addressing the presenting health concern. A significant association was found when comparing the group responses to this question, χ^2 (3, N = 1032) = 30.79, $p <$ .001, with fewer dentists and more pharmacists answering negatively than was expected given the overall distribution of responses.

To investigate perceptions of the effectiveness of potential strategies to prevent and address PDM, participants were asked to rate on a scale from 1 (*not at all*) to 7 (*very*) how helpful 17 specific strategies would be to them. The strategies and their mean ratings and standard deviations are presented in Table 17. Separate one-way ANOVAs were conducted to examine group differences on all of the strategies; these are summarized in Table 17 (see Table B.5 in Appendix B for the ANOVA results of these analyses). The results revealed that participants rated all of the strategies as helpful. Access to pain and mental health professionals were rated the highest, followed by access to a provincial database of patients' prescriptions and clinical guidelines for management of high-risk patients. A significant group effect indicated that nurses rated access to pain and mental health professionals higher than physicians, dentists and pharmacists. Strategies involving access to management and prescribing guidance (e.g., clinical guidelines on prescribing stimulants and sedatives) were also rated within the top six strategies.

Table 17: Mean and Standard Deviation Ratings of Potential Strategies for Preventing and Addressing PDM

Strategies[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Better connections with other professionals in areas such as chronic pain management and mental health	5.99 (1.22)	5.65 (1.52)	5.59 (1.30)	5.84 (1.30)	6.16 (1.09)	Nurses rated higher than physicians (p = .001), dentists (p < .001) and pharmacists (p = .006)
Improved access to a provincial database of patients' prescriptions	5.89 (1.45)	5.80 (1.53)	5.95 (1.39)	5.79 (1.61)	5.93 (1.39)	N/A
Clinical guidelines for management of high-risk patients	5.79 (1.26)	5.09 (1.59)	5.58 (1.22)	5.73 (1.24)	5.96 (1.17)	Physicians rated lower than dentists (p = .026), nurses (p < .001) and pharmacists (p < .001); dentists rated lower than nurses (p = .018)
Increased supports for the Canadian Guidelines for Safe and Effective Use of Opioids for Chronic Non-cancer Pain	5.39 (1.49)	5.01 (1.65)	4.94 (1.60)	5.25 (1.43)	5.57 (1.42)	Nurses rated higher than physicians (p = .003), dentists (p < .001) and pharmacists (p = .044)
Better understanding of reporting protocols and how information is used, tracked and shared	5.36 (1.51)	4.45 (1.70)	5.26 (1.50)	5.38 (1.57)	5.51 (1.41)	Physicians rated lower than dentists (p = .001), nurses (p < .001) and pharmacists (p < .001)
Clinical guidelines on prescribing stimulants and sedatives	5.21 (1.64)	4.74 (1.82)	5.25 (1.61)	5.07 (1.60)	5.32 (1.62)	Physicians rated lower than nurses (p = .008)
Website with clinical information	5.07 (1.54)	4.58 (1.74)	5.08 (1.52)	4.76 (1.63)	5.24 (1.45)	Nurses rated higher than physicians (p < .001) and pharmacists (p = .001)
Office materials such as treatment agreement and patient information	5.04 (1.54)	4.83 (1.69)	4.64 (1.52)	4.94 (1.51)	5.17 (1.51)	Dentists rated lower than nurses (p = .006)
Healthcare professional mentor to contact by phone or email	4.91 (1.71)	4.66 (1.77)	4.94 (1.74)	4.71 (1.78)	5.02 (1.66)	N/A
Online course on prescribing opioids, stimulants and sedatives	4.86 (1.72)	4.55 (1.70)	4.84 (1.79)	4.76 (1.69)	4.93 (1.71)	N/A
One-day course on prescribing opioids, stimulants on sedatives	4.85 (1.75)	4.34 (1.78)	4.82 (1.78)	4.67 (1.77)	4.99 (1.72)	Physicians rated lower than nurses (p = .003)

Strategies[1]	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[2]
Quick-reference pocket guide on prescribing opioids, stimulants and sedatives	4.68 (1.79)	4.19 (1.92)	5.25 (1.56)	4.39 (1.73)	4.75 (1.80)	Physicians rated lower than nurses (p = .023); dentists rated higher than nurses (p = .041) and pharmacists (p < .001)
Better enforcement by regulatory bodies	4.64 (1.83)	3.95 (1.90)	3.84 (1.89)	5.11 (1.57)	4.75 (1.76)	Nurses and pharmacists rated higher than physicians and dentists (all ps < .001)
Provincial or federal legislation changes	4.46 (1.87)	4.19 (1.99)	3.61 (1.92)	4.86 (1.72)	4.53 (1.83)	Pharmacists rated higher than physicians (p = .020) and dentists (p < .001); dentists rated lower than nurses (p < .001)
Urine toxicology tests	4.54 (1.81)	4.72 (1.94)	3.94 (1.82)	4.42 (1.71)	4.66 (1.80)	Dentists rated lower than physicians (p = .012) and nurses (p = .001)
1-800 help line with a clinician	4.31 (1.87)	4.23 (1.95)	4.91 (1.67)	3.99 (1.89)	4.32 (1.87)	Dentists rated higher than nurses (p = .013) and pharmacists (p < .001)
Better law enforcement	4.17 (1.91)	3.56 (1.90)	3.73 (1.93)	4.76 (1.71)	4.16 (1.92)	Pharmacists rated higher than physicians (p < .001), dentists (p < .001) and nurses (p < .001); physicians rated lower than nurses (p = .019)

[1] The strategies have been sorted in descending order according to the overall group mean.

[2] Follow-up pairwise comparisons were conducted only on individual groups, after finding a significant group effect (see Table B.5 in Appendix B). All comparisons were controlled using a Bonferroni correction to control for Type I error.

Strategies to Prevent and Address PDM: Qualitative Results

A total of 622 participants responded to an open-ended question to identify what they feel is needed to help address the issue of PDM, revealing the five key themes discussed below.

Access to Prescription Data

Across all four groups of participants, the development of an easily accessible system to review patient medications and other healthcare providers was described. For example, one physician wrote that he or she would like to see "quick simple access to all meds [a] patient has been prescribed in the province." It was argued that this system must be province-wide. While some stated that it should be used for high-risk prescription medication or patients specifically, most indicated that it should clearly cover all medications. Further, participants argued that it should be required. One pharmacist explained, "every prescription goes through their central database in real time." Another pharmacist wrote, "better tracking of prescriptions filled (Netcare is a good start). Ensure all pharmacies are uploading patient information so the data is up to date." A dentist wrote:

> "Instead of having a triplicate program by paper, we should have it online in addition to paper. We could log in, prescribe the medication online and have a copy printed and signed by the practitioner. These prescriptions would stay in the online secure system and allow other clinicians to make sure they are not prescribing too frequently or that the patient is not shopping for doctors."

More Time with Patients

Participants described that having more time with patients would allow them to be more thorough in their assessment, gathering of patient history, diagnosis and patient teaching. For example, one nurse stated, "staff is being overworked and don't have the proper time to do patient teaching." A pharmacist wrote, "make it harder for patients to access targeted medication [by ensuring they] have to have an interview/assessment each time."

Access to Resources for Patients

Participants identified a need to be able to direct patients to specialized resources. Suggestions included access to mental health resources and addiction treatment centres. The most commonly cited resource involved access to chronic pain specialists. In some cases, it was stipulated that, while specialists are available, access should be timelier.

Education

Participants frequently identified education as a key strategy needed to address PDM. Education was not directed at any particular aspect of healthcare, but rather it was said to be necessary for patients, the public and healthcare professionals. For example, a physician wrote, "public media campaign and more public information," while a dentist wrote, "re-educating providers periodically and outlining protocols/limits with a provincial database."

Over-Prescriber Enforcement

Some participants indicated that a direct solution involved the punishment of healthcare providers who over-prescribe. One nurse stated, "better governing and enforcement of protocols for all persons responsible for prescribing these drugs; better accountability of these professionals." One physician

called for "more investigations and intervention for the over-prescribing MD." A pharmacist wrote, "I feel the College of Physicians and Surgeons allows too much prescribing of opioids by certain physicians."

Communication among Healthcare Professionals Regarding Prescriptions

Participants were asked a series of questions about their communication and interactions with other healthcare professionals with respect to prescriptions. As these questions were only applicable to specific participant groups, question branching was used. Therefore, the data relevant to each participant group are presented separately.

Physicians' Communication with Other Healthcare Professionals

Physicians were first asked to indicate how often in the past year they interacted with pharmacists regarding opioid, stimulant, and sedative or tranquillizer prescriptions. Table 18 provides the frequency distribution of responses across each type of prescription. Half (50%) of the physicians surveyed reported communicating with pharmacists on a weekly to monthly basis regarding opioid prescriptions. Large percentages of physicians reported never interacting with pharmacists about prescriptions for stimulants (52.0%) or sedatives or tranquillizers (30.6%).

Table 18: Frequency with Which Physicians Reported Communicating with Pharmacists About Opioid, Stimulant, and Sedative or Tranquillizer Prescriptions

Prescription type	Never	Quarterly	Bi-monthly	Monthly	Weekly
Opioids	16.3%	26.5%	7.1%	21.4%	28.6%
Stimulants	52.0%	20.4%	6.1%	12.2%	9.2%
Sedatives/Tranquillizers	30.6%	19.5%	8.2%	22.4%	19.4%

A Friedman test was conducted to examine differences in responding among the three prescription types and responses among opioids (M_{rank} = 2.41), stimulants (M_{rank} = 1.54), and sedatives or tranquillizers (M_{rank} = 2.05) were found to be different, χ^2 (2, N = 98) = 71.56, p < .001. Follow-up pairwise comparisons using the Wilcoxon Signed Rank Test found that communication between physicians and pharmacists regarding opioids was more frequent than for stimulants (z = -6.27, p < .001) and sedatives or tranquillizers (z = -3.24, p = .001). Further, communication regarding sedatives was found to be more frequent than for stimulants (z = -5.26, p < .001).

Physicians were then asked to rate how likely they were to have encountered 10 specific situations with pharmacists in the previous three months (1 [*not at all*] to 7 [*extremely likely*]). The mean and standard deviation ratings for each situation are presented in Table 19. The most likely situation encountered involved being contacted by a pharmacist to verify a prescription. The least likely situation to be encountered was the pharmacist not adequately answering or addressing a physician's questions or concerns.

Table 19: Mean and Standard Deviation Ratings for How Likely Physicians Felt They Were to Encounter Situations with a Pharmacist in the Last Three Months

Situation[1]	Mean (*SD*)
Pharmacist called to verify something that is already stated on the prescription	3.17 (2.09)
Pharmacist dispensed medication without a prescription when they could not reach the physician	3.09 (2.20)
Pharmacist made a recommendation to a patient that I felt was inappropriate	3.07 (1.94)
Pharmacist paged or called for minor issues or non-emergencies	3.06 (2.12)
Pharmacist challenged a prescription that I felt was appropriate	2.81 (1.90)
Pharmacist requested a change in the wording of a prescription	2.80 (2.10)
Pharmacist was difficult to reach directly by phone	2.44 (1.97)
Pharmacist dispensed medication earlier than the time stated on the prescription	2.12 (1.64)
Pharmacist did not seem very knowledgeable about the medication	2.00 (1.59)
Pharmacist did not adequately answer my question or address my concern about the medication	1.84 (1.52)

[1] The situations have been sorted in descending order according to the overall group mean.

Physicians were also asked to indicate how often in the past year they interacted with nurses regarding prescriptions for opioids, stimulants, and sedatives or tranquillizers. A large portion of physicians indicated that they communicated with nurses on a weekly basis regarding opioids (40.2%) and sedatives or tranquillizers (39.2%) (Table 20). In comparing responses across opioids (M_{rank} = 2.22), stimulants (M_{rank} = 1.61) and sedatives (M_{rank} = 2.16), a significant difference was found, χ^2 (2, N = 97) = 59.85, p < .001. Follow-up pairwise comparisons showed that physicians communicated with nurses about opioids more than stimulants (z = -5.43, p < .001) and sedatives or tranquillizers more than stimulants (z = -5.36, p < .001). There was no difference in the frequency of such communication between opioid and sedative or tranquillizer prescriptions.

Table 20: Frequency with Which Physicians Reported Communicating with Nurses About Opioid, Stimulant and Sedative or Tranquillizer Prescriptions

Prescription type	Never	Quarterly	Bi-monthly	Monthly	Weekly
Opioids	25.8%	11.3%	5.2%	17.5%	40.2%
Stimulants	59.8%	7.2%	3.1%	12.4%	17.5%
Sedatives or tranquillizers	30.9%	8.2%	6.2%	15.5%	39.2%

Physicians were then asked to rate on a scale from 1 (*not at all*) to 7 (*extremely likely*) how likely they were to have encountered five specific situations with nurses in the previous three months. Overall, the mean ratings on the items were low, indicating that physicians reported they were unlikely to have encountered these situations (Table 21).

Table 21: Mean and Standard Deviation Ratings for How Likely Physicians Felt They Were to Encounter Situations with a Nurse in the Last Three Months

Situation[1]	Mean (*SD*)
Nurse pressured me to prescribe something to keep the patient calm or quiet (e.g., benzodiazepines or painkillers)	2.60 (1.91)
Did not feel that nurse's assessment of opioid intoxication, withdrawal or pain was accurate	2.27 (1.84)
Nurse felt that the patient was drug-seeking or difficult and I did not necessarily agree	2.20 (1.68)
Nurse felt uncomfortable administering the medication that I prescribed	2.11 (1.75)
Nurse disagreed with my prescription or medical order	1.88 (1.49)

[1] The situations have been sorted in descending order according to the overall group mean.

Dentists' Communication with Other Healthcare Professionals

Dentists were asked to indicate how often in the past year they interacted with pharmacists regarding opioid, stimulant and sedative or tranquillizer prescriptions. As presented in Table 22, dentists communicate infrequently with pharmacists regarding these three categories of prescription drugs.

Table 22: Frequency with Which Dentists Reported Communicating with Pharmacists About Opioid, Stimulant and Sedative or Tranquillizer Prescriptions

Prescription type	Never	Quarterly	Bi-monthly	Monthly	Weekly
Opioids	59.5%	19.8%	2.7 %	9.0%	9.0%
Stimulants	90.9 %	6.4%	0.9%	0.9%	0.9%
Sedatives/Tranquillizers	72.7%	17.3%	1.8%	6.4%	1.8%

Dentists were also asked to rate, on a scale from 1 (*not at all*) to 7 (*extremely likely*), how likely they were to have encountered 10 specific situations with pharmacists in the previous three months. Inspection of Table 23 reveals that dentists consistently reported that each situation was unlikely to have occurred.

Table 23: Mean and Standard Deviation Ratings for How Likely Dentists Felt They Were to Encounter Situations with a Pharmacist in the Last Three Months

Situation[1]	Mean (*SD*)
Pharmacist was difficult to reach directly by phone	2.24 (1.92)
Pharmacist called to verify something that is already stated on the prescription	1.89 (1.63)
Pharmacist paged/called for minor issues or non-emergencies	1.70 (1.33)
Pharmacist challenged a prescription that I felt was appropriate	1.61 (1.21)
Pharmacist requested a change in the wording of a prescription	1.55 (1.18)
Pharmacist did not seem very knowledgeable about the medication	1.43 (1.21)
Pharmacist made a recommendation to a patient that I felt was inappropriate	1.39 (1.11)
Pharmacist did not adequately answer my question or address my concern about the medication	1.32 (1.07)
Pharmacist dispensed medication without a prescription when they could not reach the dentist	1.19 (0.65)
Pharmacist dispensed medication earlier than the time stated on the prescription	1.17 (0.69)

[1] The situations have been sorted in descending order according to the overall group mean.

Pharmacists' Communication with Other Healthcare Professionals

Pharmacists were asked a series of questions regarding their interactions with both physicians and dentists. To begin, pharmacists were asked to indicate how often in the past year they interacted with physicians regarding opioid, stimulant, and sedative or tranquillizer prescriptions. Table 24 provides the frequency distribution of responses across each type of prescription.

In examining differences in responding among the three prescription types, responses among opioids (M_{rank} = 2.35), stimulants (M_{rank} = 1.46), and sedatives or tranquillizers (M_{rank} = 2.19) were found to be different, χ^2 (2, N = 199) = 167.16, p < .001. Follow-up pairwise comparisons found that communication about opioids was more frequent than that about stimulants (z = -9.26, p < .001) and sedatives or tranquillizers (z = -3.43, p = .001). Further, communication regarding sedatives or tranquillizers was found to be more frequent than that regarding stimulants (z = -8.65, p < .001).

Pharmacists were then asked to rate on a scale from 1 (*not at all*) to 7 (*extremely likely*) how likely they were to have encountered four specific situations with physicians in the previous three months. As shown in Table 24, pharmacists reported that all of the situations with physicians were likely to have been encountered.

Table 24: Mean and Standard Deviation Ratings for How Likely Pharmacists Felt They Were to Encounter Situations with a Physician in the Last Three Months

Situation[1]	Mean (*SD*)
Physician was difficult to reach directly by telephone	5.56 (2.10)
Physician did not promptly return calls	5.17 (2.12)
Physician was not receptive to your concerns	4.12 (2.13)
Physician did not communicate or was not willing to share therapeutic plan	4.10 (2.15)

[1] The situations have been sorted in descending order according to the overall group mean.

Pharmacists were also asked to indicate how often in the past year they interacted with dentists about prescriptions for opioids, stimulants, and sedatives or tranquillizers. Table 25 provides the frequency distribution of responses across each type of prescription. Significant differences in the responses among opioids (M_{rank} = 2.28), stimulants (M_{rank} = 1.75), and sedatives or tranquillizers (M_{rank} = 1.98) were identified, χ^2 (2, N = 200) = 101.81, p < .001. Follow-up pairwise comparisons found that communication about opioids to be more frequent than that about stimulants (z = -7.42, p < .001) and sedatives or tranquillizers (z = -5.50, p < .001). Communication about sedatives or tranquillizers was significantly more frequent than that about stimulants (z = -5.13, p < .001).

Table 25: Frequency with Which Pharmacists Reported Communicating with Dentists About Opioid, Stimulant and Sedative or Tranquillizer Prescriptions

Prescription type	Never	Quarterly	Bi-monthly	Monthly	Weekly
Opioids	62.0%	23.5%	4.0%	8.0%	2.5%
Stimulants	96.0%	3.5%	0.5%	0.0%	0.0%
Sedatives/Tranquillizers	80.1%	12.4%	3.0%	4.0%	0.5%

Pharmacists were then asked to rate on a scale from 1 (*not at all*) to 7 (*extremely likely*) how likely they were to have encountered four specific situations with dentists in the previous three months. Table 26 provides the mean and standard deviation ratings for each situation. Unlike the response pattern with situations concerning physicians, pharmacists reported that all of the situations with dentists were unlikely to have occurred.

Table 26: Mean and Standard Deviation Ratings for How Likely Pharmacists Felt They Were to Encounter Situations with a Dentist in the Last Three Months

Situation[1]	Mean (*SD*)
Dentist was difficult to reach directly by telephone	2.68 (2.15)
Dentist did not promptly return calls	2.32 (1.79)
Dentist was not receptive to your concerns	1.96 (1.50)
Dentist did not communicate or was not willing to share therapeutic plan	1.86 (1.42)

[1] The situations have been sorted in descending order according to the overall group mean.

To assess perceptions of prescribing practices, pharmacists were asked to rate on a scale from 1 (*not at all*) to 7 (*extremely likely*) how likely they were to have witnessed five specific prescribing practices. Table 27 provides the mean and standard deviation ratings for each prescribing practice. Overall, pharmacists reported that experiencing each prescribing practice was likely. The practices rated most likely to occur included seeing a medication prescribed to someone the pharmacist suspected was misusing and seeing medications contraindicated prescribed together.

Table 27: Mean and Standard Deviation Ratings of How Likely Pharmacists Were to Have Encountered Specific Prescribing Practices

Prescribing practice[1]	Mean (*SD*)
Prescribed to a patient you suspected was misusing the prescribed medication.	5.52 (1.91)
Prescribed medications that should not be taken together (e.g., sedatives and opioids).	5.25 (1.87)
Prescribed to a patient who, in your opinion, probably does not require the medication.	4.92 (1.97)
Prescribed medication dosages that, in your opinion, were too high.	4.84 (1.94)
Prescribed increases in medication too quickly.	4.03 (1.94)

[1]The prescribing practices have been sorted in descending order according to the overall group mean.

Nurses' Communication with Other Healthcare Professionals

Nurses were asked to indicate how often in the past year they had interacted with physicians regarding opioid, stimulant, and sedative or tranquillizer prescriptions; Table 28 presents the frequency distribution of responses across each type of prescription. Group differences were found with respect to communication regarding prescriptions for opioids (M_{rank} = 2.25), stimulants (M_{rank} = 1.60), and sedatives or tranquillizers (M_{rank} = 2.15), χ^2 (2, N = 624) = 337.80, p < .001. Specifically, communication about opioids was found to be more frequent than that about stimulants (z = -13.49, p < .001) or sedatives or tranquillizers (z = -3.93, p = .001). Communication with physicians regarding sedatives or tranquillizers was also found to be more frequent than that for stimulants (z = -12.64, p < .001).

Table 28: Frequency with Which Nurses Reported Communicating with Physicians About Opioid, Stimulant, and Sedative or Tranquillizer Prescriptions

Prescription type	Never	Quarterly	Bi-monthly	Monthly	Weekly
Opioids	22.5%	14.2%	5.3%	15.2%	42.7%
Stimulants	47.5%	16.8%	7.3%	9.3%	19.1%
Sedatives or tranquillizers	24.6%	16.1%	5.5%	15.8%	37.9%

Using a scale from 1 (*not at all*) to 7 (*extremely likely*), nurses were also asked to rate how likely they were to have encountered five specific situations with physicians in the previous three months. Inspection of Table 29 reveals that all of these situations were rated below the midpoint of the scale, indicating that these situations were unlikely to have been encountered. The highest rated situation was that nurses disagreed with the prescription or medical order.

Table 29: Mean and Standard Deviation Ratings for How Likely Nurses Felt They Were to Encounter Situations with a Physician in the Last Three Months

Situation[1]	Mean (*SD*)
I disagreed with the prescription or medical order	3.08 (2.04)
I felt the physician needed to prescribe something to keep the patient calm or quiet but the physician disagreed	2.69 (1.89)
I felt the patient was drug-seeking or difficult and the physician did not agree	2.69 (2.03)
I felt uncomfortable administering the prescribed medication to the patient	2.60 (1.99)
The physician questioned the accuracy of my assessment of the patient's intoxication, withdrawal or pain	2.18 (1.73)

[1] The situations have been sorted in descending order according to the overall group mean.

Improving Communication among Healthcare Professionals: Qualitative Results

Through an open-ended question, participants were asked to provide suggestions for improving communication among healthcare professionals. A total of 360 participants responded. Overall, responses were consistent, leading to the identification of two themes.

Teamwork

Many participants alluded to working as a multidisciplinary team and sharing information. In answering how communication could be improved, a physician said, "understand what each role plays and how to converse with them when it comes to patients." Another physician mirrored this comment and wrote, "team support and education. Knowing what the others from the team are doing." Participants also indicated that trusting each other's' abilities was important in a team. One nurse wrote, "TEAMWORK!! That is the key. If physicians actually viewed allied health professionals as competent." A dentist argued, "we need to work together for the benefit of the patient and lose

the hierarchy." A physician highlighted the need for respect and stated the importance of "respecting each discipline's body of knowledge and what they can offer and being open to suggestions."

Reporting

In line with the previous discussion concerning strategies for preventing and addressing PDM, participants reiterated the need for a system of reporting and accessing patient healthcare information. For the system to work, participants indicated it had to be accessible by all healthcare professionals. For example, one nurse stated, "allow dentists to access medical database[s]," while another nurse wrote that the database is about "sharing of electronic records."

Exploring the Types of PDM

At the beginning of the survey, participants were provided with a definition of PDM that included misusing a prescription drug intentionally for recreational purposes as well as for therapeutic benefits other than prescribed. It was also stated that patients could misuse prescription drugs unintentionally because they misunderstand the instructions or have a faulty memory. All participants were asked to rate a series of statements designed to explore perceptions of the different types of PDM on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Table 30 presents the statements, along with their mean ratings and standard deviations. Given the overall means, the results show that participants rated most of the items within close proximity to the centre of the scale. This suggests a high degree of similarity or overlap in concerns regarding whether PDM is intentional, unintentional, or for therapeutic or recreational reasons.

When group differences among the statements were examined (see Table B.6 for the results of these analyses and follow-up pairwise comparisons), the results showed that pharmacists agreed more strongly than nurses that intentional PDM occurs more frequently than unintentional PDM (Table 30). Dentists were found to agree more strongly than pharmacists with the statement, "I am more concerned about intentional PDM with my patients than I am about unintentional PDM." Finally, physicians and dentists both agreed more strongly than pharmacists and nurses with the statement, "I am more concerned about intentional PDM for recreational reasons than I am about intentional PDM for therapeutic benefits."

Table 30: Mean and Standard Deviation Ratings of Statements Exploring the Different Types of PDM

Statements	All	Physicians	Dentists	Pharmacists	Nurses	Results of sig. pairwise comparisons[1]
Intentional PDM occurs more frequently than unintentional PDM	4.39 (1.71)	4.43 (1.72)	4.45 (1.63)	4.71 (1.71)	4.27 (1.71)	Pharmacists rated higher than nurses (p = .009)
Misusing prescription drugs for recreational reasons occurs more frequently than misusing drugs for the therapeutic benefits	4.10 (1.68)	4.06 (1.66)	4.37 (1.63)	4.09 (1.68)	4.07 (1.69)	N/A
I am more concerned about intentional PDM with my patients than I am about unintentional PDM	3.81 (1.99)	4.19 (1.89)	4.27 (1.84)	3.62 (1.95)	3.73 (2.03)	Dentists rated higher than pharmacists (p = .038)
I am more concerned about intentional PDM for recreational reasons than I am about intentional PDM for therapeutic benefits	4.02 (1.96)	4.57 (1.97)	4.50 (1.79)	3.84 (1.88)	3.92 (1.98)	Physicians rated higher than nurses (p = .013) and pharmacists (p = .015); dentists rated higher than pharmacists (p = .025) and nurses (p = .024)
The clinical presentations of intentional PDM for recreational reasons are the same as the clinical presentations of intentional PDM for therapeutic benefits	3.20 (1.60)	3.06 (1.66)	3.31 (1.56)	3.07 (1.46)	3.24 (1.63)	N/A
It is more difficult to identify intentional PDM for recreational reasons than it is to identify intentional PDM for therapeutic benefits	3.72 (1.68)	3.87 (1.64)	4.07 (1.64)	3.55 (1.62)	3.70 (1.70)	N/A

[1] Follow-up pairwise comparisons were conducted only on individual groups, after finding a significant group effect (see Table B.6 in Appendix B). All comparisons were controlled using a Bonferroni correction to control for Type I error.

Discussion

The purpose of this study was to examine the perceptions of PDM among a sample of Alberta healthcare professionals, including physicians and surgeons, registered nurses and nurse practitioners, pharmacists, and dentists. A clear understanding of healthcare professionals' perceptions of PDM is needed to help inform the development of educational and prevention initiatives aimed at reducing the associated harms of PDM. Specific perceptions examined include:

1. The extent and distribution of PDM;
2. Clinical characteristics of PDM;
3. Risk factors for PDM;
4. Barriers to identifying PDM;
5. Communication among healthcare professionals regarding prescriptions; and
6. Strategies for preventing and addressing PDM.

Through the use of an anonymous online survey, data were collected from a sample of 1,063 healthcare professionals from Alberta. In particular, 99 physicians, 112 dentists, 202 pharmacists and 650 nurses completed the survey.

Summary of Major Findings and Implications for Practice and Education

The Estimated Distribution of PDM in Patient Populations

This study suggests that healthcare professionals' perceptions of PDM are dependent upon the category of drugs investigated and the patient's characteristics. When suspected cases of PDM were compared across the different drug categories within each patient category group, the data indicated that different categories of drugs were suspected of being associated with PDM depending on the patient category. For example, among adult and senior patients and patients with a mental health diagnosis, healthcare professionals suspected that sedative or tranquillizer misuse was more frequent, followed by opioid misuse and the misuse of stimulants. For patients with chronic pain or a history of substance abuse, estimates of suspected misuse were highest for opioids, followed by sedatives and then stimulants. The frequency of suspected opioid and sedative or tranquillizer misuse was found to be equal in patients with nonspecific symptoms. Interestingly, no differences were observed in the frequencies of suspected PDM among youth patients. While it is not possible to determine from this study the accuracy of these estimated rates of misuse, the healthcare professionals who participated in the study did indicate that known cases of PDM were generally more frequent among those patients with chronic pain, vague symptoms, a history of substance abuse or a mental health diagnosis. Primary research aimed at reviewing actual patient records is needed to provide a more accurate estimate of PDM and compare results to perceptions of PDM.

Most previous studies that have investigated healthcare professionals' perceptions and experiences regarding PDM have focused on physicians' perceptions of opioid misuse (e.g., Baldacchino et al., 2010; Bendtsen, Hensing, Ebeling, & Schedin, 1999; Bhamb et al., 2006; Keller et al., 2012; Morley-Forster et al., 2003; Nwokeji, Rascati, Brown, & Eisenberg, 2007; Potter et al., 2001; Wenghofer et al., 2011; Wolfert et al., 2010) and have reported concerns with the misuse of this type of

medication. The current study builds on this literature by demonstrating that healthcare professionals are also concerned about suspected misuse of prescription sedative or tranquillizer medications among certain groups of their patients. In light of healthcare professionals' concerns regarding suspected PDM among their patients, screening, brief intervention and referral to treatment (SBIRT) may be an effective approach to address this problem (Cochran et al., 2013; Otto et al., 2009; Zahradnik et al., 2009). Additional research is needed, though, to demonstrate the efficacy of the SBIRT model for PDM (Young et al., in press).

Indicators of PDM

This study identified a list of patient behaviours that were perceived by physicians, dentists, pharmacists and nurses to indicate PDM. At the top of that list were two behaviours: *altering the delivery of the medication* and *patient's use of the medication is different than prescribed.* These behaviours are consistent with general definitions of PDM that involve using medications in a manner other than prescribed (Boyd & McCabe, 2008; Hernandez & Nelson, 2010; McCabe, West, & Boyd, 2013). Also at the top of the list was a series of drug-seeking behaviours, including double doctoring, doctor shopping, requesting a replacement for lost or stolen medication, requesting specific medications, and coming in early to refill prescriptions. These results are consistent with drug-seeking behaviour identified in previous research with physicians, nurses and pharmacists (Baldacchino et al., 2010; Bendsten, Hensing, Ebeling, et al., 1999; Bhamb et al., 2006; Butler & Sheridan, 2010; Damestoy et al., 1999; Goldblatt, 2009; Monheit, 2010; Payne et al. 2011). Two items related specifically to physiological symptoms of PDM were the lack of improved function and the appearance of intoxication. Although these were identified as indicators of PDM, they were rated lower than most drug-seeking behaviours. Kahan and colleagues (2011) found that 35% of pharmacists from Ontario observed intoxicated patients at the pharmacy, which raised concerns about misuse. It is possible that healthcare professionals sampled in this study considered intoxication and lack of improved functioning to be ambiguous and instead relied on other indicators to assess PDM.

The accurate assessment of PDM is critical to the success of intervention initiatives. The results of this study have produced a list of behavioural indicators that could inform the development of a multidisciplinary screening tool to assist healthcare professionals in accurately identifying PDM in their patients, if these indicators are validated as being associated with PDM. One concern with identifying PDM is distinguishing between problematic drug-seeking behaviour and legitimate pain relief-seeking behaviour (Joranson & Gilson, 2001). Situations such as oligoanalgesia (i.e., the undertreatment of pain) can lead to a myriad of problems such as patient anger, depression, low self-worth, anxiety, mistrust, isolation and suicide (Propenhagen & Kuntz, 2006). Patients with chronic pain will often present with behaviours consistent with drug-seeking behaviour, such as requesting specific prescription drugs that work for them, making frequent visits to healthcare professionals, and becoming agitated when discussing possible changes to therapy. The results of this study could be used to inform the development of a tool that can accurately distinguish drug-seeking behaviour from legitimate pain relief-seeking behaviour. For example, a behaviour that was less likely to be perceived as being indicative of PDM was requesting the dispensing of a smaller quantity than prescribed. Although this may not indicate PDM, it is certainly related and can help rule out drug-seeking behaviour. Patients with chronic pain seek to manage their pain rather than use opioids for sedation and euphoria, and may request less medication to limit side effects (Propenhagen & Kuntz, 2006).

The results further highlighted that multiple healthcare professionals can and should play a role in the assessment of PDM. Pharmacists rated a number of behaviours as stronger indicators of PDM than the other participant groups. These behaviours included *requesting certain medication not to be billed through the patient's routine insurance plan*, and *requesting medication dispensed in the original manufacturer's container*. The likely explanation for the group difference in ratings is that pharmacists play the more significant role in dispensing and billing prescription medication and are thus more aware of these behaviours.

PDM Risk Factors

Overall, participants from each healthcare professional group agreed that PDM risk factors are too difficult or impossible to characterize. Payne and colleagues (2011) similarly reported that participants in their study felt it was impossible to predict who was at greatest risk for PDM. Such perceptions are likely related to the complexity of the conditions associated with the misuse of prescription opioids and sedatives or tranquillizers, including pain management, mental health and substance abuse. The identification of accurate risk factors for PDM, however, is critical to preventing harms among patients. When people are considered to be at risk, steps can be taken to reduce that risk (e.g., finding alternative prescription drugs or non-drug alternatives, engaging in careful monitoring). The results of this study can help to inform future efforts to develop a risk assessment strategy, as these results have identified a hierarchy of risk factors. At the top of the list are factors related to previous and active alcohol and drug abuse. This result is consistent with previous research indicating that patients with a history of substance abuse are perceived to be at risk for PDM. Potter and colleagues (2001) reported that 16% of physicians in their sample said they would never prescribe opioids to a patient with a substance abuse history, while 42% said they would not prescribe to a current substance abuser. The findings from the current work emphasize the need for multidisciplinary care approaches and understanding the totality of the patient's condition and environment.

The lowest ranking risk factors in this study were demographic variables such as age and gender, suggesting that participants placed more importance on specific patient conditions than on basic demographics in making judgments of risk. Previous research has mainly focused on the association between healthcare perceptions and patients with either a substance abuse history or chronic pain. Given that prescription drug use is more frequent in older populations (Gu, Dillon & Burt, 2010) due to a high prevalence of pain and insomnia (Payne et al., 2011), it could be expected that seniors would have the greatest potential for the harms associated with prescription drug use. While a small number of studies have investigated physicians' perceptions of PDM in seniors, it appears PDM in seniors takes on a different perspective. Cook and colleagues (2007) found that physicians were more tolerant of long-term sedative use in seniors than younger people. Physicians were also said to view continued use as compassionate whereas discontinuing the medication would cause unnecessary suffering. Similarly, Damestoy and colleagues (1999) reported that physicians were focused more on preventing short-term deterioration rather than long-term consequences. Participants in this study may share similar views, which might explain why the factor of being a senior did not receive a higher rating.

Not only can the accurate identification of risk factors help prevent the harms associated with prescription drugs, but it can also help prevent harms associated with mistakenly over-attributing risk to a patient that could negatively impact the delivery of treatment. Inaccurate risk assessment has been argued to lead to the under-treatment of patients with chronic pain. Morley-Forster and colleagues (2003) found that 23% of physicians interested in palliative care and 35% interested in non-cancer pain would not prescribe opioids even after two previous non-opioid drugs failed to

manage patient pain. Similarly, a study of physicians in the United States found that 35% would not prescribe Schedule II opioids following repeated attempts to manage moderate to severe chronic nonmalignant pain (Potter et al., 2001). Inaccurate risk factors can also lead to stereotyping patients and affect the therapeutic alliance. Butler and Sheridan (2010) argued that healthcare professionals stigmatized patients they deemed to be "abusers," which led to a lack of empathy. Further, if healthcare professionals' perceptions of risk are influenced by stereotypes, potentially problematic behaviour will be overlooked in patients who deviate from the stereotype.

Barriers to Identifying PDM

Four types of barriers were found to impact the ability of participants to identify PDM in their patients. First, lack of patient honesty was consistently rated the highest by all groups of participants. Second, healthcare professionals perceived a lack of communication as a strong barrier. In particular, the lack of communication with patients and their families, as well as a reluctance to talk to patients about PDM were rated highly. Third, barriers relating to the inaccessibility of support from other healthcare professionals were strongly indicated. This included, for example, lack of communication with the patient's other healthcare professionals, limited access to chronic pain or addiction specialists, and difficulty accessing provincial prescribing databases. The final barrier pertained to inadequate education and training, and included challenges such as confusing and obscure symptoms of PDM, and inadequate knowledge or training of practitioners.

These results are consistent with previous research findings. For example, physicians have been found to mistrust patients. Reasons identified for this mistrust stem back to fears that patients will become addicted and misuse the prescription drugs (Baldacchino et al., 2010; Bendtsten, Hensing, McKenzie, & Stridsman, 1999). Popenhagen and Kuntz (2006) argued that trust plays a central role in patient assessment, particularly in patients with chronic pain. For example, these patients may rate their pain as moderate to severe despite the absence of sympathetic responses (e.g., tachycardia, hypertension, grimacing) to pain stimuli. Without these measurable indicators, healthcare professionals must rely on patient reports.

Lending further support to the findings in this study, Payne and colleagues (2011) identified three types of barriers in their qualitative study of physicians and nurse practitioners. These barriers included a need for healthcare professionals to communicate with each other to obtain a complete patient history, no consensus on what constitutes PDM, and confusing and obscure symptoms. The first step to addressing these barriers is to establish consensus on the conceptualization of PDM. This process can be facilitated through the development of protocols for assessing the risks and indicators of PDM discussed in previous sections. From there, education and training efforts can be established to help healthcare professionals address issues of PDM. Finally, strategies need to be developed to facilitate communication among healthcare professionals.

Strategies to Help Prevent and Address PDM

Participants in this study did not feel they were overly effective in preventing and addressing PDM. It should be noted that there were group differences that identified nurses reported feeling less effective than did physicians, dentists and pharmacists; and pharmacists reported feeling less effective than did physicians. However, mean ratings across the groups remained close to the mid-point of the scale. One explanation for this finding may come from responses to another question, in which 74.2% of respondents indicated they did not have adequate support in preventing and addressing PDM. The results reported here are consistent with findings from previous research that

have reported that more education is required (Bendtsten et al., 1999; Cochran et al., 2013; Cook et al., 2007; Goldblatt, 2009; Hooten & Bruce, 2011; Keller et al., 2012).

The call for more education was also among the highest rated strategies in the current study. Healthcare professionals are typically able to recognize that they lack the training necessary to manage patients and prescriptions when involvement in PDM is suspected. Keller and colleagues (2012) reported that physicians evaluated their own medical training in chronic pain management and opioid dependence as unsatisfactory. In another study, 50% of Canadian physicians indicated the need to improve education in pain management (Morley-Forster et al., 2003). A study of pharmacists reported that 67.5% received two hours or less of addiction and substance abuse education and 29.2% reported having none (Lafferty et al., 2006). The study further found that more education was associated with an increased likelihood to counsel patients.

Previous research has also indicated a need for education and resources regarding guidelines and regulations on prescribing practices. For example, pharmacists and physicians were found to have an incomplete understanding of regulations and policies (Joranson & Gilson, 2001). Fear of legal or regulatory scrutiny has been argued to negatively impact physicians' prescribing practices (Morley-Forster et al., 2003; Nwokeji et al., 2007) and pharmacists' decisions to stock and dispense opioids (Greenwald & Narcessian, 1999; Joranson & Gilson, 2001). Therefore, it is critical that healthcare professionals have access to guidelines and a clear understanding of the policies and regulations regarding prescription drugs and the harms associated with their use.

One further implication pertaining to the results on effective strategies involves the development of a prescription database, which has also been recognized previously (Kahan et al., 2011). Alberta currently has an electronic health record system called Netcare. However, previous research has identified that healthcare professionals find the system to be problematic and time-consuming (Goldblatt, 2009). In the current study, all groups of participants said that access to a provincial database would be very helpful in preventing and addressing PDM. Participants also mirrored this in their open-ended comments, stating that the database must be easy to access, cover all medications and be accessible by all healthcare professionals involved in prescribing and dispensing medication.

Communication among Healthcare Professionals Regarding Prescriptions

Perceptions of communication among healthcare professionals were investigated separately among each group of participants. Physicians were asked about the frequency and nature of their interactions with pharmacists and nurses over the past 12 months. Close to 84% of physicians reported contacting a pharmacist on at least a quarterly basis to discuss opioids. This is compared to 69.5% and 47.9% reporting the same frequency of communication regarding sedatives or tranquillizers and stimulants, respectively. The frequency of communication regarding opioids is higher than the 73.9% of Ontario physicians who reported contacting pharmacists in the previous year (Wenghofer et al., 2011). Overall, physicians indicated that their interactions with pharmacists were positive. With respect to interacting with nurses, 74.2% of physicians reported quarterly communication regarding opioids compared to 69.1% and 40.2% regarding sedatives or tranquillizers and stimulants, respectively. Wenghofer and colleagues reported that only 36.2% of Ontario physicians reported communicating with nurses about opioid therapy.

While physicians' responses indicated positive communication experiences with nurses and pharmacists, pharmacists did not perceive their communication with physicians as positively. Pharmacists reported that physicians were difficult to reach by phone, did not promptly return phone

calls, and were not overly receptive to their concerns. These results are consistent with previous research, where 61% of pharmacists reported that physicians did not respond to their concerns, 43% said physicians were difficult to reach by phone, and 28% said physicians did not promptly return their phone calls (Kahan et al., 2011). The authors also reported that pharmacists experienced physician prescribing practices that concerned them, such as prescribing sedatives and opioids together. Again, these results were mirrored in this study, as pharmacists reported they were likely to have encountered such practices within the previous three months.

Contrary to their interactions with physicians, pharmacists had more positive perceptions about their interactions with dentists when asked identical questions about this healthcare group. Pharmacists reported that they were unlikely to have difficulty reaching the dentist by the phone, or to have trouble having their phone calls promptly returned. Further, pharmacists reported that dentists were likely to be receptive to their concerns and willing to share their therapeutic plan.

This is the first known study to examine dentists' perceptions of communicating with pharmacists. In particular, 40.4% of dentists reported communicating with a pharmacist about opioids on a quarterly basis in the previous year. Just over 27.3% and 9.1% reported the same frequency of communication with pharmacists regarding sedatives or tranquillizers and stimulants, respectively. Just as pharmacists reported positive interactions with dentists, dentists reciprocated positive interactions with pharmacists.

This study provides valuable insight into the communication among healthcare professionals by including the perspectives of four health professional groups. The results indicate that physicians communicate frequently with both pharmacists and nurses, and while both physicians and nurses indicated positive perceptions, pharmacists' perceptions were contrary to physicians. This highlights that there are communication issues that need to be resolved, and more importantly, that physicians may not be aware these communication issues exist.

In their open-ended responses, healthcare professionals reported two clear strategies to improving communication: teamwork and a reporting database. In terms of teamwork, participants from all four groups expressed interest in learning how to work together to provide each patient the best care possible. To develop effective teamwork initiatives, a needs assessment should be conducted specifically to explore the needs and challenges that each healthcare group faces. This will help to ensure that a program is developed that can meet every group's needs. The second strategy involved creating a prescription-reporting database that healthcare providers could access and use to share information. To address these strategies, research methods could be used to directly engage healthcare professionals in solving the problems they encounter in terms of inter-professional teamwork and reporting databases.

Types of PDM

Participants in the current study reported finding the symptoms of PDM to be obscure or confusing and the risk factors too difficult or impossible to characterize. Throughout the literature, a number of terms describing PDM can be found, such as extramedical use, misuse and abuse (Zacny & Lichtor, 2008). McCabe and colleagues (2013) used the term *medical misuse* to refer to using prescription drugs in a manner not intended by the prescriber (e.g., using too much, to get high). Barrett and colleagues (2008) identified the term *nonprescribed use* that refers to the use of prescription drugs without a prescription. This term would exclude people who are misusing (e.g., using too much) their own legitimately prescribed drug. A more commonly used term is *nonmedical use*. This term is more general and can include people who misuse another person's prescription drugs, people who divert their prescription drugs to another person (e.g., giving their prescription drugs to another family

member), or misuse their own prescription drugs in terms of altering the route of administration (e.g., injecting or snorting), or using the prescription drug for reasons other than prescribed, such as to get high (Boyd & McCabe, 2008; Hernandez & Nelson, 2010; Shield et al., 2013). The term *nonmedical use* is not specific and can vary across studies (Hernandez & Nelson, 2010).

Another term that should be considered is *substance use disorder*, which is more specific and draws on the criteria established in the DSM-5 and involves elements of tolerance, withdrawal and loss of control over the drug (American Psychiatric Association, 2013). However, there are difficulties in applying DSM criteria for substance use disorders for individuals who have therapeutic uses for prescription medications (Sproule, 2008). Health Canada convened a consensus workshop in 2006 to establish the most appropriate terminology to use when conducting research on psychoactive prescription drug abuse, and reached consensus on the following definition for *abuse*:

> For psychoactive pharmaceuticals with centrally acting reinforcing properties, abuse is defined as use that is associated with increased risk for harm, as characterized by obtaining the drugs from illegitimate sources, or risky patterns of use (excluding under-use) that deviate from accepted medical practice and/or scientific knowledge, or taking the drugs for purposes which are not therapeutic (Health Canada, 2007).

In anticipation that participants would have varying conceptualizations of PDM, a definition of this construct was provided at the beginning of the survey. That definition included misusing prescription drugs intentionally for recreational purposes as well as for the therapeutic benefits other than prescribed. It was also stated that patients could misuse prescription drugs unintentionally because they misunderstand the instructions or have a faulty memory. This definition encompassed multiple behaviours that could be engaged in for multiple reasons. Barrett and colleagues (2008) have argued that using a single criterion would not capture the multiple patterns of behaviours, risks and harms. To explore this issue, this study used six questions to examine participants' perceptions of the different motivations of PDM (i.e., intentional vs. unintentional for therapeutic vs. recreational reasons).

Although group differences were found on three of the items, participants tended to respond in close proximity to the middle of the scale, suggesting that their perceptions and concerns of PDM are similar in regards to whether PDM is intentional or unintentional and for therapeutic or recreational reasons. One exception to this is that participants agreed (pharmacists more than physicians, dentists and nurses) that intentional PDM occurs more frequently than unintentional PDM. These results are important, because they demonstrate participants have an equal concern when asked to consider the different motivations behind PDM. Further, these data highlight that treating all PDM as homogenous is problematic because doing so does not capture the different motivating factors behind the misuse. For example, a person who orally administers an oral opioid to relieve pain even though it was not prescribed for that person presents a different level of risk than a person who injects the same oral opioid to get high (Barrett et al., 2008).

Future Direction for Research

Since perceptions can be influenced by personal biases and experiences and stereotypes, further research is needed to validate healthcare professionals' perceptions of the PDM problem. This is particularly important given the stigma that is associated with substance abuse.

Future research attention should also be placed on developing a screening tool that can accurately identify patients who are misusing, or those who are at risk of misusing, their prescription medications. This tool should contain two features. First, it should use multiple indicators to ensure that several behaviours are considered. When participants were asked in an open-ended question to

identify other behaviours they associate with PDM, many identified single behaviours. The extent to which healthcare professionals might base their decisions on a single behaviour is unclear, but with the development of a tool, healthcare professionals will be able to base their decisions on as much information as possible. Second, the tool should be multi-disciplinary, as the data in this study demonstrated that different healthcare professionals can provide unique insight into drug-seeking behaviour and other indicators of PDM.

The results of this study can also guide the development of an accurate risk assessment tool. The current work identified a hierarchical list of risk factors based on healthcare professionals' perceptions. Some of these factors, such as psychiatric disorders and cognitive impairment, which were perceived to be strong risk factors, warrant additional investigation. It is important that the predictive validity of these risk factors be assessed. For example, Wolfert and colleagues (2010) argued that recent research has shown that a history of substance abuse does not necessarily predict future misuse in patients using prescription opioids to manage their pain.

Finally, the results of this study indicate that strategies are required to improve inter-professional communication. Future research is required to identify strategies that will be the most effective both in terms of being accepted by healthcare professionals and in solving communication problems. Action research should be considered in this process, as it engages intervention targets throughout the process of identifying what is not working and how to solve the problem in a manner that meets everyone's needs.

Limitations

To assess the validity of this study, it is important to consider some of its limitations. First, this study was conducted with a sample of four groups of healthcare professionals from Alberta, and so caution must be used when extrapolating the findings to healthcare professionals in other provinces and territories throughout Canada. This study also did not include all healthcare professionals that may play a role in PDM, such as social workers and psychologists. Future research examining the perceptions of other healthcare professionals with respect to PDM would be beneficial.

Second, although this study had an overall sample size of 1,063, this number constitutes a small percentage of the population of healthcare professional in Alberta. It is common for quantitative studies to report response rates; however, due to the nature of the methodology employed in this study, it is not possible to calculate an accurate response rate. For example, the research team was provided email contact information for members of ACP and CARNA. While the initial number of emails in these lists could be used to calculate the response rate, it must be recognized that not all of the email addresses were valid. Further, it is not possible to know exactly how many emails were in fact received and opened by the intended recipients. As for members of CPSA, recruitment was limited to a posting on the organization's website, postings in two monthly newsletters, and mailing postcard advertisements. Overall, it is not possible to know exactly how many healthcare professionals received the invitation, and thus it cannot be determined how many chose not to participate. Although an accurate response rate cannot be calculated, it can be safely estimated as low given the number of emails, newsletter postings and postcard advertisements that were sent out. It should be noted, however, that response rates are not valid assessments of potential survey bias (Davern, 2013; Skalland, 2011). To assist in judging the validity of this study, it is important to consider that the geographical distribution of participants across the province was consistent with the population data that were available at the time of writing this report. Further, a number of results from this study were consistent with findings from other studies conducted in Canada and abroad. Together, these attributes provide insight into the validity of the results reported.

Third, the sample largely comprised females (77%) and as such the generalizability of these findings to each of the health professional groups examined may be limited. This is most likely due to the large representation of nurses in the sample, as females tend to make up the majority of this professional field (Canadian Instititute for Health Information, 2011). Thus, an important extension of the current study would be to examine whether gender influences healthcare professionals' perceptions of PDM.

Fourth, as discussed in previous sections, there are variations in the conceptualization of PDM. These variations have been argued to impact the collection of data on the topic (Barrett et al., 2008; Boyd & McCabe, 2008; Shield et al., 2013; Zacny & Lichtor, 2008). In response to the possibility that participants would have multiple definitions of PDM, a definition was provided at the beginning of the survey. However, it has been argued that providing a formal definition may not be sufficient to override the pre-established definitions that participants already have (Malle, 1999; Malle & Nelson, 2003). Future research would benefit from identifying the nature of participants' pre-conceptualized definitions.

Fifth, two statistical issues must be considered. First, to reduce the overall length of time it would take participants to complete the survey, a four-point quartile rank scale was used to estimate the percentage of patients prescribed, known to misuse, and suspected of misusing specific categories of prescription drugs. Identifying percentages according to quartiles (e.g., 1–25%, 26–50%) is not a sensitive measure. Caution must be used when interpreting these data due to the large gaps contained within each quartile. Further, these scales resulted in data that required the use of nonparametric analyses (i.e., those that do not assume the sample is normally distributed). An inherent disadvantage to these procedures is that they lack statistical power. Therefore, the ability to detect group differences may have been limited. Second, there was considerable variation in the four participant group sizes (e.g., 650 nurses vs. 99 physicians). Therefore, caution should be taken when considering overall means and group means. It is important to note, however, that even though group differences were found, responses in each group were in the same direction (i.e., the group means were on the same side of the scale).

Sixth, although this study focused on healthcare professionals' perceptions of PDM across a variety of patient characteristics, it did not include socioeconomic factors. It is possible that such factors could influence healthcare professionals' perceptions beyond the patient characteristics that were examined. Future research investigating this association is warranted.

Conclusion

This was the first known study to examine the perceptions of physicians, dentists, pharmacists and nurses about the misuse of prescription drugs. Overall, the results identified numerous similarities in perceptions of PDM across the four healthcare professional groups, as well as differences in key areas. As a result, this study demonstrates the importance of including multiple healthcare groups and numerous drug classes in PDM research. The present work has also found that healthcare professionals did not perceive PDM as homogeneous; rather they perceived it to be dependent on the category of the prescription drug and the characteristics of the patient. However, future research is required to determine if these results can be extrapolated to other healthcare providers outside of Alberta.

Participants reported that it was impossible to identify risks factors for PDM, yet they did report certain behaviours that may characterize PDM. These findings could inform the development of a multidisciplinary screening tool that addresses different drug classes to help identify PDM among patients. This tool could help prevent stereotyping of “abusers” and the under-treatment of individuals who legitimately require pain relief. This study also noted that healthcare professionals do not feel overly effective in preventing and addressing PDM in their patients, with only 26% feeling they have adequate support to do so. This is not surprising, as health professionals have previously reported receiving very little substance abuse training and requiring greater knowledge of pain management. Professional colleges and associations should recognize the importance of providing continuing education that addresses identification and intervention for the harms associated with prescription drugs, as well as guidelines for risk management and prescribing practices.

Improved communication among physicians and pharmacists, as well as access and connections with pain, mental health and addiction specialists were cited as needs to better address PDM. Communication and teamwork among professionals should be encouraged and could be informed by a needs assessment completed by all involved parties. Treatment system planners and decision makers should recognize that communication could also be facilitated by improvements to the existing electronic health record system; making it readily available to all professionals involved in prescribing and dispensing medication, as well as including all medications in the system, would allow the shared patient database to contribute to PDM prevention. With these aids in place, healthcare professionals will be better equipped to prevent, identify and address PDM in their patients and reduce the harms associated with this public health crisis.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Baldacchino, A., Gilchrist, G., Fleming, R., & Bannister, J. (2010). Guilty until proven innocent: A qualitative study of the management of chronic non-cancer pain among patients with a history of substance abuse. *Addictive Behaviors, 35*, 270–272.

Barrett, S. P., Meisner, J. R., & Stewart, S. H. (2008). What constitutes prescription drug misuse? Problems and pitfalls of current conceptualizations. *Current Drug Abuse Reviews, 1*, 255–262.

Bendtsten, P., Hensing, G., Ebeling, C., & Schedin, A. (1999). What are the qualities of dilemmas experienced when prescribing opioids in general practice? *Pain, 82*, 89–96.

Bendtsten, P., Hensing, G., McKenzie, L., & Stridsman, A. (1999). Prescribing benzodiazepines — A critical incident study of a physician dilemma. *Social Science & Medicine, 49*, 459–467.

Bhamb, B., Brown, D., Hariharan, J., Anderson, J., Balousek, S., & Fleming, M. F. (2006). Survey of select practice behaviors by primary care physicians on the use of opioids for chronic pain. *Current Medical Research and Opinion, 22*, 1859–1865.

Boak, A., Hamilton, H. A., Adlaf, E. M., & Mann, R. E. (2013). *Drug use among Ontario students 1977–2013: Detailed Ontario Student Drug Use and Health Survey findings* (CAMH Research Document Series No. 36). Toronto: Centre for Addiction and Mental Health.

Boyd, C. J., & McCabe, S. E. (2008). Coming to terms with the nonmedical use of prescription medications. *Substance Abuse, Treatment, Prevention, and Policy, 22*(3). 1–3.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101.

Butler, R., & Sheridan, J. (2010). Innocent parties or devious drug users: The views of primary healthcare practitioners with respect to those who misuse prescription drugs. *Harm Reduction Journal, 7*, 1–11.

Canadian Centre on Substance Abuse. (2013, March). *First Do No Harm: Responding to Canada's Prescription Drug Crisis*. Ottawa, ON: Author.

Canadian Institute for Health Information (2011). *Canada's Health Care Providers 2009 Provincial Profiles: A Look at 24 Health Occupations*. Ottawa ON. Retrieved from: secure.cihi.ca/free_products/ProvProf2009EN.pdf.

Cochran, G., Field, G., Lawson, K., & Erickson, C. (2013). Pharmacists' knowledge, attitudes and beliefs regarding screening and brief intervention for prescription opioid abuse: A survey of Utah and Texas pharmacists. *Journal of Pharmaceutical Health Services Research, 4*, 71–79.

Cook, J. M., Marshall, R., Masci, C., & Coyne, J. C. (2007). Physicians' perspectives on prescribing benzodiazepines for older adults: A qualitative study. *Society of General Internal Medicine, 22*, 303–307.

Corneil, T., Elefante, J., May-Hadford, J., Goodison, K., & Harris, B. (2012). *Non-illicit, non-methadone, prescription opiate overdose deaths in BC's Interior Region: Findings from a retrospective case series, 2006–2011*. British Columbia Interior Health Alert.

Damestoy, N., Collin, J., & Lalande, R. (1999). Prescribing psychotropic medication for elderly patients: Some physicians' perspectives. *Canadian Medical Association Journal, 161*, 143–145.

Davern, M. (2013). Nonresponse rates are a problematic indicator of nonresponse bias in survey research. *Health Research and Educational Trust, 48*, 905–912.

Dhalla, I. A., Mamdani, M. M., Sivilotti, M. L. A., Kopp, A., Qureshi, O., & Juurlink, D. N. (2009). Prescribing of opioid analgesics and related mortality before and after the introduction of long-acting oxycodone. *Canadian Medical Association Journal, 181*(12), 891–896.

Expert Working Group on Narcotic Addiction. (2012). *The way forward: Stewardship for prescription narcotics in Ontario*. Toronto: Author.

Firth, H., & Gleeson, K. (2004). Clothing and embodiment: Men managing body image and appearance. *Psychology of Men & Masculinity, 5*(1), 40–48.

Fischer, B., & Argento, E. (2012). Prescription opioid related misuse, harms, diversion and interventions in Canada: A review. *Pain Physician, 15*, ES191–ES203.

Fischer, B., Jones, W., & Rehm, J. (2014). Trends and changes in prescription opioid analgesic dispensing in Canada 2005–2012: An update with a focus on recent interventions. *BMC Health Services Research, 14*, 1–8.

Goldblatt, A. (2009). *Caught in the web of addictive prescription medication: Summary report on focus groups of the Coalition on Prescription Drug Misuse*. Edmonton: Coalition on Prescription Drug Misuse.

Gomes, T. Mamdani, M.M., Dhalla, I.A., Cornish, S., Paterson, J.M., Juurlink, D.N. (2014). The burden of premature opioid-related mortality. *Addiction, 109,* 1482-1488.

Government of Alberta. (2011, September). *Creating Connections: Alberta's Addiction and Mental Health Strategy. Alberta Health Services, Government of Alberta*. Retrieved from www.health.alberta.ca/documents/Creating-Connections-2011-Strategy.pdf.

Government of Alberta. (2011, September). *Prescription Drug Misuse in Alberta: Everyone's Problem. A report by Alberta's Chief Medical Officer of Health*. Retrieved from www.health.alberta.ca/documents/CMOH-Prescription-Drug-Misuse-2011.pdf.

Greenwald, B. D., & Narcessian, E. J. (1999). Opioid for managing patients with chronic pain: Community pharmacists' perspectives and concerns*. Journal of Pain and Symptom Management, 17*, 369–375.

Gu, Q., Dillon, C. F., & Burt, V. L. (2010). *Prescription drug use continues to increase: U.S. prescription drug data for 2007–2008* (NCHS data brief, no 42). Hyattsville, MD: National Center for Health Statistics.

Hagemeier, N. E., Gray, J. A., & Pack, R. P. (2013). Prescription drug abuse: A comparison of prescriber and pharmacist perspectives. *Substance Use & Misuse, 48*, 761–768.

Hansen, R. N., Oster, G., Edelsberg, J., Woody, G. E., & Sullivan, S. D. (2011). Economic costs of nonmedical use of prescription opioids. *Clinical Journal of Pain, 27*, 194–202.

Health Canada. (2007). *Workshop to Build Consensus on Concepts and Indicators for Research on Psychoactive Pharmaceutical "Abuse"*. Ottawa, ON: Author.

Health Canada. (2013). *Canadian Alcohol and Drug Use Monitoring Survey (CADUMS): Summary of Results for 2012*. Ottawa, ON: Health Canada.

Hernandez, S. H., & Nelson, L. S. (2010). Prescription drug abuse: Insight into the epidemic. *Clinical Pharmacology & Therapeutics, 88*(3), 307–317.

Hooten, W. M., & Bruce, B. K. (2011). Beliefs and attitudes about prescribing opioids among healthcare providers seeking continuing medical education. *Journal of Opioid Management, 7*, 417–424.

International Narcotics Control Board. (2014). *Narcotic drugs: Estimated world requirements for 2014—Statistics for 2012*. New York: United Nations.

Joranson, D. E., & Gilson, A. M. (2001). Pharmacists' knowledge of and attitudes toward opioid pain medications in relation to federal and state policies. *Journal of American Pharmacists Association, 41*, 213–220.

Kahan, M., Wilson, L., Wenghofer, E. F., Srivastava, A., Resnick, A., Janecek, E., & Sheehan, C. (2011). Pharmacists' experiences with dispensing opioids: Provincial survey. *Canadian Family Physician, 57*, e448–e458.

Keller, C. E., Ashrafioun, L., Neumann, A. M., Van Klein, J., Fox, C. H., & Blondell, R. D. (2012). Practices, perceptions, and concerns of primary care physicians about opioid dependence associated with the treatment of chronic pain. *Substance Abuse, 33*, 103–113.

Lafferty, L., Hunter, T. S., & Marsh, W. A. (2006). Knowledge, attitudes and practice of pharmacists concerning prescription drug abuse. *Journal of Psychoactive Drugs, 38*, 229–233.

Malle, B. F. (1999). How people explain behavior: A new theoretical framework. Personality and *Social Psychology Review, 3*, 23–48.

Malle, B. F., & Nelson, S. E. (2003). Judging mens rea: The tension between folk concept and legal concepts of intentionality. *Behavioral Sciences and the Law, 21*, 563–580.

McCabe, S. E., West, B. T., & Boyd, C. J. (2013). Medical use, medical misuse, and nonmedical use of prescription opioids: Results from a longitudinal study. *Pain, 154*, 708–713.

Monheit, B. (2010). Prescription drug misuse. *Australian Family Physician, 39*, 540–546.

Morley-Forster, P. K., Clark, A. J., Speechley, M., & Moulin, D. E. (2003). Attitudes toward opioid use for chronic pain: A Canadian physician survey. *Pain Research & Management, 8*, 189–194.

Nwokeji, E., Rascati, K. L., Brown, C. M., & Eisenberg, A. (2007). Influences of attitudes on family physicians' willingness to prescribe long-acting opioid analgesics for patients with chronic nonmalignant pain. *Clinical Therapeutics, 29*, 2589–2602.

Otto, C., Crackau, B., Lohrmann, I., Zahradnik, A., Bischof, G., John, U., & Rumpf, H. J. (2009). Brief intervention in general hospital for problematic prescription drug use: 12-month outcome. *Drug and Alcohol Dependence, 105*, 221–226.

Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Payne, M., Gething, M., Moore, A. A., & Reid, M. C. (2011). Primary care providers' perspectives on psychoactive medication disorders in older adults. *American Journal of Geriatric Pharmacotherapy, 9*(3), 164–172.

Popenhagen, M. P., & Kuntz, K. R. (2006). Understanding of pain and fears of addiction in pediatric chronic pain patients: How do we stop the problem. *Journal for Specialists in Pediatric Nursing, 11*, 61–67.

Potter, M., Schafer, S., Gonzalez-Mendez, E., Gjeltema, K., Lope, A., Wu, J., … Croughan-Minihane, M. (2001). Opioids for chronic nonmalignant pain: Attitudes and practices of primary care physicians in the UCSF/Stanford collaborative research network. *Journal of Family Practice, 50*, 145–151.

Royal Canadian Mounted Police. (2010). *Report on the illicit drug situation in Canada, 2009*. Ottawa: Royal Canadian Mounted Police.

Sheridan, J., & Butler, R. (2011). Prescription drug misuse in New Zealand: Challenges for primary health care professionals. *Research in Social & Administrative Pharmacy, 7*, 281–293.

Shield, K. D., Ialomiteanu, A., Fischer, B., & Rehm, J. (2013). Assessing the prevalence of non-medical prescription opioid use in the Canadian general adult population: Evidence of large variation depending on survey questions used. *BMC Psychiatry, 13*(6).

Skalland, B. (2011). An alternative to the response rate for measuring a survey's realization of the target population. *Public Opinion Quarterly, 75*, 89–98.

Smith, A. J., Sketris, I., Cooke, C., Gardner, D., Kisley, S., & Tett, S. E. (2008). A comparison of benzodiazepine and related drug use in Nova Scotia and Australia. *Canadian Journal of Psychiatry, 53*, 545–552.

Sproule, B. (2008, May). *Abuse of Psychotropic Pharmaceuticals in Canada: A Situational Analysis, 2008 Update*. Prepared for Office of Research and Surveillance, Health Canada.

Stoddard, K. I., & Huggett, D. B. (2012). Pharmaceutical take back programs. In B. W. Brooks, & D. B. Huggett (eds.), *Human pharmaceuticals in the environment: Current and future perspectives*. Springer Science & Business Media.

Twombly, E.C., & Holtz, K.D. (2008). Teens and the misuse of prescription drugs: Evidence-based recommendations to curb a growing societal problem. *Journal of Primary Prevention, 29*, 503–516.

Wenghofer, E. F., Wilson, L., Kahan, M., Sheehan, C., Srivastava, A., Rubin, A., & Brathwaite, J. (2011). Survey of Ontario primary care physicians' experiences with opioid prescribing. *Canadian Family Physician, 57*, 324–332.

Wild, C., Wolfe, J., Newton-Taylor, M., & Kang, H. (2008). *Prescription drug misuse in Edmonton and Alberta: A rapid assessment*. Edmonton: University of Alberta.

Wolfert, M. Z., Gilson, A. M., Dahl, J. L., & Cleary, J. F. (2010). Opioid analgesics for pain control: Wisconsin physicians' knowledge, beliefs, attitudes, and prescribing practices. *Pain Medicine, 11*, 425–434.

Young, M. M., Stevens, A., Galipeau, J., Pirie, T., Garritty, C., Singh, K., … Moher, D. (in press). Effectiveness of brief interventions as part of the Screening, Brief Intervention and Referral to Treatment (SBIRT) model for reducing the non-medical use of psychoactive substances: a systematic review. *Systematic Reviews*.

Zacny, J. P., & Lichtor, S. (2008). Nonmedical use of prescription opioids: Motive and ubiquity issues. *The Journal of Pain, 9*, 473–486.

Zahradnik, A., Otto, C., Crackau, B., Lohrmann, I., Bischof, G., John, U., & Rumpf, H. J. (2009). Randomized controlled trial of a brief intervention for problematic prescription drug use in non-treatment-seeking patients. *Addiction, 104*, 109–117

Appendix A: Expert Panel Composition

The following list identifies the members of the expert panel, who represented a variety of healthcare professionals and organizations addressing issues related to prescription drug misuse:

- Dr. Amy Porath-Waller, Canadian Centre on Substance Abuse (CCSA)
- Dr. Susan Ulan and Sgt. Lorne Adamitz, Coalition on Prescription Drug Misuse (CoOPDM)
- Dr. Trevor Theman, College of Physicians and Surgeons of Alberta (CPSA)
- Jim Krempien, Alberta College of Pharmacists (ACP)
- Carolyn Trumper and Donna Harpell-Hogg, College and Association of Registered Nurses of Alberta (CARNA)
- Dr. Cathy Scrimshaw, Alberta College of Family Physicians (ACFP)
- Dr. Gordon Thompson, Alberta Dental Association & College (ADA+C)
- Dr. Bruna Brands, National Advisory Council on Prescription Drug Misuse (NACPDM)

Appendix B: Supplementary Data Results

The following data are presented here to supplement the results discussed in the section on Results. All supplementary data are organized according to their corresponding section of the results.

Table B.1: One-way ANOVA and Follow-up Comparison Results Investigating Group Differences on the Indicators of PDM

One-way ANOVA results

Behaviours	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
Altering delivery of medication	3.34	3, 1044	= .019	Pharmacists rated higher than dentists (p = .013)
Prescription forgeries	4.13	3, 1047	= .006	Pharmacists rated higher than nurses (p = .018)
Double doctoring	3.97	3, 1047	= .008	Pharmacists rated higher than nurses (p = .011)
Doctor shopping	5.56	3, 1049	= .001	Pharmacists rated higher than nurses (p = .001)
Family or caregiver expresses worry	.65	3, 1050	= .759	N/A
Patient's use of medication is different than prescribed	2.17	3, 1048	= .091	N/A
Request replacement for lost or stolen medication	12.64	3, 1043	< .001	Nurses rated lower than physicians (p < .001) and pharmacists (p < .001)
Requesting that opioid, stimulant or sedative medication NOT be billed through patient's routine insurance plan	20.26	3, 1047	< .001	Pharmacists rated higher than physicians (p < .001), dentists (p = .001) and nurses (p < .001)
Only requesting the opioid, stimulant or sedative portion of a prescription to be filled	10.06	3, 1043	< .001	Nurses rated lower than dentists (p = .037) and pharmacists (p < .001)
Come in early to refill prescription	15.91	3, 1050	< .001	Physicians rated higher than dentists (p = .017) and nurses (p = .001); pharmacists rated higher than dentists (p < .001) and nurses (p < .001)
Request specific drugs	4.13	3, 1027	= .005	Dentists rated higher than nurses (p = .026)
Frequent visits to prescribers	4.34	3, 1047	= .005	Pharmacists rated lower than dentists (p = .004) and nurses (p = .037)
Change reasons for returning to prescriber	0.65	3, 1046	= .584	N/A
Disproportionate pain/disability for presenting problem	2.89	3, 1047	= .035	Physicians rated higher than pharmacists (p = .045)
Appear intoxicated	6.10	3, 1050	< .001	Physicians rated higher than dentists (p = .008) and nurses (p = .007); pharmacists rated higher than nurses (p = .043)
Lack of improved function	4.19	3, 1043	= .127	N/A

Behaviours	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
Resistant to switch to another medication	3.31	3, 1046	= .019	Physicians rated higher than dentists (p = .034), nurses (p = .017) and pharmacists (p = .079)
Hoarding medication	0.70	3, 1048	= .553	N/A
Request medication dispensed in original/sealed manufacturer's container	31.65	3, 1049	< .001	Pharmacists rated higher than physicians (p = .004), dentists (p < .001) and nurses (p < .001)
Request "brand only" be dispensed	37.96	3, 1046	< .001	Pharmacists rated higher than physicians (p = .004), dentists (p < .001) and nurses (p < .001); physicians rated higher than dentists (p = .006) and nurses (p < .004)
Request dispensing of a smaller quantity than prescribed	1.59	3, 1041	= .190	N/A

[1] All follow-up pairwise comparisons were controlled using a Bonferroni correction.

Table B.2: One-way ANOVA Comparing Physicians, Dentists, Pharmacists and Dentist's Agreement that PDM Risk Factors are too Difficult or Impossible to Characterize

One-way ANOVA results

	M	*SD*	*F*	*df*	*p*
Physicians	2.26	1.59	1.66	3, 1014	.174
Dentists	2.64	1.44			
Pharmacists	2.53	1.35			
Nurses	2.60	1.49			

Table B.3 One-way ANOVA and Follow-up Comparison Results Investigating Group Differences on Potential PDM Risk Factors

One-way ANOVA results

Behaviours	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
History of substance abuse	5.10	3, 1049	= .002	Pharmacists rated higher than nurses (p = .003)
Recent or active illicit drug use	2.18	3, 1047	= .089	N/A
Suicidal ideation	2.76	3, 1045	= .041	Nurses rated higher than physicians (p = .034)
Chronic pain	5.42	3, 1047	= .001	Nurses rated higher than pharmacists (p = .001)
Recent or active alcohol use	0.73	3, 1051	= .535	N/A
Psychiatric disorders (e.g., depression, anxiety, PTSD)	0.31	3, 1053	= .816	N/A
History of sexual abuse	4.10	3, 1051	= .007	Nurses rated higher than dentists (p = .008)
Chronic medical conditions or diseases	19.51	3, 1047	< .001	Nurses rated higher than physicians (p < .001) and pharmacists (p < .001); dentists rated higher than pharmacists (p = .001)
Cognitive impairment	6.45	3, 1049	< .001	Nurses rated higher than dentists (p = .003) and pharmacists (p = .010)
Nonspecific symptoms	9.41	3, 1046	< .001	Pharmacists rated lower than physicians (p < .001), dentists (p = .023) and nurses (p < .001)
Adult (25–64 years old)	4.38	3, 1052	= .004	Nurses rated higher than dentists (p = .047) and pharmacists (p = .037)
Youth (10–24 years old)	3.95	3, 1045	= .008	Pharmacists rated lower than physicians (p = .034) and nurses (p = .045)
Senior (65 + years old)	16.52	3, 1041	< .001	Physicians rated higher than dentists (p = .005); nurses rated higher than dentists (p < .001) and pharmacists (p < .001)
Male	4.53	3, 1049	< .001	Nurses rated higher than pharmacists (p = .039)
Female	8.07	3, 1051	< .001	Physicians rated higher than pharmacists (p = .024); nurses rated higher than dentists (p = .011) and pharmacists (p = .039)

[1] All follow-up pairwise comparisons were controlled using a Bonferroni correction.

Table B.4: One-way ANOVA and Follow-up Comparison Results Investigating Group Differences on the Barriers to Identifying PDM
One-way ANOVA results

Barriers	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
Lack of communication with patient	13.71	3, 1050	< .001	Nurses rated higher than physicians (p < .001), dentists (p = .005) and pharmacists (p < .001)
Insufficient time with patients	31.82	3, 1051	< .001	Dentists rated lower than physicians (p = .001), nurses (p < .001) and pharmacists (p < .001); nurses rated higher than physicians (p = .001) and pharmacists (p < .001)
Lack of communication with patient's other healthcare professionals	4.66	3, 1050	= .003	Nurses rated higher than physicians (p = .010)
Lack of access to chronic pain or addiction specialists	11.40	3, 1047	< .001	Nurses rated higher than physicians (p = .003), dentists (p < .001) and pharmacists (p = .002)
Reluctance to inquire about PDM with patients	23.61	3, 1046	< .001	Physicians rated lower than dentists (p = .001), nurses (p < .001) and pharmacists (p < .001); nurses rated higher than dentists (p < .004) and pharmacists (p = .027)
Uncertainty regarding reporting lines and who to advise if a patient is misusing	10.64	3, 1045	< .001	Physicians rated lower than dentists (p = .005), nurses (p < .001) and pharmacists (p = .001)
Lack of communication with patient's family	10.50	3, 1050	< .001	Nurses rated higher than dentists (p = .010) and pharmacists (p < .001)
Inadequate knowledge or training of practitioners	12.52	3, 1044	< .001	Nurses rated higher than physicians (p < .001) and dentists (p < .001); pharmacists rated higher than dentists (p = .015)
Lack of communication with the patient's pharmacist	13.66	3, 1042	< .001	Nurses rated higher than physicians (p < .001) and pharmacists (p < .001)
Difficulty accessing provincial prescribing database	20.75	3, 1038	< .001	Nurses rated higher than physicians (p < .001) and pharmacists (p < .001); dentists rated higher than physicians (p = .003)
The symptoms of PDM are obscure or confusing	10.92	3, 1044	< .001	Physicians rated lower than dentists (p = .003), nurses (p < .001) and pharmacists (p = .010)
Availability of walk-in clinics	5.06	3, 1049	= .002	Physicians rated higher than dentists (p = .018) and pharmacists (p = .036); nurses rated higher than dentists (p = .047)
Use of emergency rooms	13.10	3, 1048	< .001	Nurses rated higher than dentists (p = .010) and pharmacists (p < .001)

[1] All follow-up pairwise comparisons were controlled using a Bonferroni correction.

Table B.5: One-way ANOVA and Follow-up Comparison Results Investigating Group Differences on the Strategies for Preventing and Addressing PDM
One-way ANOVA results

Strategies	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
Better connections with other professionals in areas such as chronic pain management and mental health	11.86	3, 1038	< .001	Nurses rated higher than physicians (p = .001), dentists (p < .001) and pharmacists (p = .006)
Improved access to a provincial database of patients' prescriptions	0.61	3, 1040	= .606	N/A
Clinical guidelines for management of high-risk patients	15.84	3, 1046	< .001	Physicians rated lower than dentists (p = .026), nurses (p < .001) and pharmacists (p < .001); dentists rated lower than nurses (p = .018)
Increased supports for the Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-cancer Pain	9.4	3, 1041	< .001	Nurses rated higher than physicians (p = .003), dentists (p < .001) and pharmacists (p = .044)
Better understanding of reporting protocols and how information is used, tracked and shared	14.78	3, 1039	< .001	Physicians rated lower than dentists (p = .001), nurses (p < .001) and pharmacists (p < .001)
Clinical guidelines on stimulants and sedatives prescribing	4.04	3, 1040	= .007	Physicians rated lower than nurses (p = .008)
Website with clinical information	8.69	3, 1035	< .001	Nurses rated higher than physicians (p < .001) and pharmacists (p = .001)
Office materials such as treatment agreement and patient information	4.77	3, 1034	= .003	Dentists rated lower than nurses (p = .006)
Healthcare professional mentor to contact by phone or email	2.52	3, 1035	= .057	N/A
Online course on prescribing opioids, stimulants and sedatives	1.7	3, 1040	= .165	N/A
One-day course on prescribing opioids, stimulants and sedatives	4.98	3, 1042	= .002	Physicians rated lower than nurses (p = .003)
Quick-reference pocket guide on prescribing opioids, stimulants and sedatives	8.29	3, 1039	= .002	Physicians rated lower than nurses (p = .023); dentists rated higher than nurses (p = .041) and pharmacists (p < .001)
Better enforcement by regulatory bodies	17.26	3, 1026	< .001	Nurses and pharmacists rated higher than physicians and dentists (all ps < .001)
Provincial or federal legislation changes	11.82	3, 1034	< .001	Pharmacists rated higher than physicians (p = .020) and dentists (p < .001); dentists rated lower than nurses (p < .001)
Urine toxicology tests	5.45	3, 1035	= .001	Dentists rated lower than physicians (p = .012) and nurses (p = .001)
1-800 help line with a clinician	5.83	3, 1039	= .001	Dentists rated higher than nurses (p = .013) and pharmacists (p < .001)

Strategies	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
Better law enforcement.	12.13	3, 1026	< .001	Pharmacists rated higher than physicians (p < .001), dentists (p < .001) and nurses (p < .001); physicians rated lower than nurses (p = .019)

[1] All follow-up pairwise comparisons were controlled using a Bonferroni correction.

Table B.6: One-way ANOVA and Follow-up Comparison Results Investigating Group Differences on the Different Types of PDM
One-way ANOVA results

Statements	*F*	*df*	*p*	Results of sig. pairwise comparisons[1]
Intentional PDM occurs more frequently than unintentional PDM	3.45	3, 1043	= .016	Pharmacists rated higher than nurses (p = .009)
Misusing prescription drugs for recreational reasons occurs more frequently than misusing drugs for the therapeutic benefits	1.03	3, 1039	= .381	N/A
I am more concerned about intentional PDM with my patients than I am about unintentional PDM	4.06	3, 1038	= .007	Dentists rated higher than pharmacists (p = .038)
I am more concerned about intentional PDM for recreational reasons than I am about intentional PDM for therapeutic benefits	5.93	3, 1038	= .001	Physicians rated higher than nurses (p = .013) and pharmacists (p = .015); dentists rated higher than pharmacists (p = .025) and nurses (p = .024)
The clinical presentations of intentional PDM for recreational reasons are the same as the clinical presentations of intentional PDM for therapeutic benefits	2.65	3, 1035	= .375	N/A
It is more difficult to identify intentional PDM for recreational reasons than it is to identify intentional PDM for therapeutic benefits	2.48	3, 1039	= .060	N/A

[1] All follow-up pairwise comparisons were controlled using a Bonferroni correction.