Original Article

Pharmacists' Role in Road Safety: A Qualitative Study on Driving While Using Prescribed Opioids

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Abstract

After two decades of steady decline, Australia's reduction in road crash fatalities has plateaued. A concerning trend is the increasing presence of prescribed potentially driving-impairing medications (PDIMs), particularly opioids, in driver autopsies. Patients receiving opioid prescriptions often lack adequate guidance about potential cognitive impairment. Pharmacists are well-positioned to offer such advice, yet their perspectives and experiences are rarely documented. This study aimed to explore pharmacists' experiences, perceptions, and opinions regarding the dispensing of prescribed opioids, with a focus on the advice they provide on driving safety. Additionally, it sought to understand pharmacists' potential roles in enhancing road safety. Ten pharmacists from the regional city of Toowoomba, Queensland, participated in semi-structured interviews conducted between November 2019 and November 2021. Interviews were transcribed and analyzed using reflexive thematic analysis to identify key themes. This research is part of a larger project exploring how doctors and pharmacists perceive their responsibilities in ensuring driving safety for patients and the broader community. Ethical approval was obtained from the Queensland University of Technology Research Ethics Committee (Reference no: 1900000374), and the study was in accordance with the Australian National Statement on Ethical Conduct in Human Research. Participants provided written informed consent at least five days after receiving detailed project information. The analysis identified three major themes: balancing road safety with personal freedom and independence, collaboration and communication with general practitioners (GPs), and variation in the scope of advice regarding opioid-related impairment and tolerance. Pharmacists recognized the potential road safety risks but were empathetic to the autonomy driving provides. Effective communication and a team-based approach with GPs emerged as key subthemes. While pharmacists offered comprehensive information about cognitive impairment, explicit references to driving were limited. Most learning about medication-related driving risks occurred informally, through on-the-job experience. Enhancing pharmacists' knowledge and skills regarding opioids could better equip opioid-medicated drivers (OMDs) to make informed driving decisions. Strengthening the collaborative relationship between pharmacists and GPs may further improve road safety outcomes for OMDs.

Keywords: Road safety, Opioids, Pharmacist practice, Driving

Introduction

Prescribed opioids play a central role in managing both cancer-related pain and chronic non-cancer pain (CNCP). Australia ranks eighth globally in population-level opioid consumption, with approximately three million Australians regularly using opioids by 2017 [1-3]. Evidence clearly indicates that acute opioid use can impair cognitive function; however, whether this impairment diminishes with long-term use remains uncertain [4]. The sole prospective study examining opioid-induced cognitive impairment, conducted in 1989, suggested that tolerance to cognitive effects could develop within one week, and further dose increases of 30% could result in additional tolerance within another week [5]. This finding has contributed to the widely held belief that individuals on stable long-term opioid regimens develop sufficient tolerance to cognitive impairment, thereby allowing them to continue driving safely.

Contrary to this assumption, a 2019 population-based case-control study found that drivers with opioids in their system were more than twice as likely (odds ratio 2.18) to be the causative factor in fatal crashes compared to non-opioid drivers [6]. Conversely, a 2005 on-road study reported no significant differences in driving performance between opioid-medicated chronic pain patients and a matched cohort

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without pain, supporting the idea that some patients with CNCP may retain safe driving capabilities [7]. The complexity is compounded by the multidimensional nature of cognitive impairment, which does not always correspond directly with driving ability; for instance, individuals with mild cognitive impairment due to early dementia may still drive safely [8].

A 2003 review found that while two-thirds of studies reported no psychomotor deficits in patients taking opioids, only half concluded that long-term opioid use lacked adverse cognitive effects [9]. A subsequent review in 2010 offered little additional clarity [4]. More recently, a 2023 longitudinal study of a cohort aged 25–100 years over 15 years identified a significant decline in visuospatial cognition among opioid users [10]. However, the impact of this decline on actual driving safety remains uncertain.

Regulations regarding driving under the influence of opioids vary internationally. Denmark and Norway implement, per se, legal limits for opioid blood concentrations [11]. In Norway, a specialist physician assesses opioid-medicated drivers (OMDs) for impairment, forming the basis for legal action rather than relying solely on blood levels [12]. Finland and Sweden enforce zero-tolerance laws, making it illegal to drive with any detectable opioid level. However, prescription use is exempt if taken as directed, and no supratherapeutic levels are present [13]. In Australia, physicians may be required to examine drivers suspected of opioid-related impairment when standard alcohol and saliva tests are negative. Blood tests are often conducted, but in the absence of per se opioid laws, their legal relevance is unclear for OMDs [14].

Australian research suggests that driving advice is inconsistently addressed in clinical practice. A qualitative study involving 23 chronic pain clinic patients reported that over 75% had not been asked about driving, and more than half noted that the potential effects of medication on driving were rarely discussed by healthcare providers [15]. Similarly, about half of 17 practitioners treating chronic pain acknowledged that driving considerations were seldom included in routine assessments, citing a lack of clear guidelines and evidence-based recommendations [15].

Among palliative care physicians, advice regarding driving for patients on opioids has also been inconsistent. A 2017 Australian study found substantial variability in practice, often diverging from established guidelines [16]. The authors emphasized that these findings are relevant to all opioid prescribers, highlighting gaps between clinical practice and guideline recommendations [16]. Swedish data indicate that 23% of palliative care patients, 65% of whom were using opioids, continued to drive [17].

Australia's previously declining road crash fatality rate has recently plateaued [18]. Autopsy data from 2006–2016 in Victoria show that while alcohol involvement in fatalities decreased by 9% per year (21.1% overall), opioid presence, the leading potentially driving-impairing medication (PDIM), rose by 6% annually (17.3%) [19]. Within oncology and palliative care settings, a recent study at a major cancer hospital reported that fewer than 20% of advanced lung cancer patients on opioids received information regarding potential driving impairment [20].

Pharmacists represent the final professional checkpoint between opioid prescription and driving for opioid-medicated drivers (OMDs). Owing to their accessibility, extended opening hours, and high trust within communities, pharmacists are considered a primary healthcare contact by approximately one-third of Australians [21]. Following trends observed internationally, Australian pharmacists are expanding their scope of practice, including prescriptive authority [22]. Legally, pharmacists dispensing potentially driving-impairing medications (PDIMs) are required to attach a label warning of possible drowsiness and advising against driving if affected. While discussing side effects with patients is regarded as best practice, it is not mandatory [23] and may be challenging during periods of high workload [24]. Consequently, patients are expected to self-regulate based on the warning label. Despite this, pharmacists' perspectives on opioids, the advice they provide regarding driving, and their perception of their professional role in this area remain poorly understood. This study aimed to explore pharmacists' experiences, perceptions, and opinions regarding the dispensing of opioids, with a particular focus on guidance provided on driving safety.

Materials and Methods

Study Design

A qualitative approach was adopted to investigate pharmacists' experiences, perceptions, and advice related to prescribing opioids, particularly concerning driving safety. The study followed the consolidated criteria for reporting qualitative research (COREQ) checklist to ensure methodological rigor [25]. The principal investigator (PI), a male palliative care consultant with previous experience as a rural general practitioner (GP), approached five pharmacies using a combination of convenience and snowball sampling to identify pharmacists dispensing opioids. The study examined prescription opioid use broadly, acknowledging that cognitive impairment may occur across a range of doses and regimens depending on patient-specific factors.

Participating pharmacies included one private hospital pharmacy and four community-based pharmacies within the hospital's catchment area in Toowoomba, Queensland, Australia. Semi-structured interviews were conducted at participants' convenience in locations such as pharmacies, professional rooms, or a gymnasium. Interviews were audiotaped with only the PI and participant present, and no repeat interviews were conducted. The interview guide drew on the PI's extensive experience in driver licensing and assessing driving impairment, and was reviewed by the

research team. The approach was further refined in consultation with an experienced qualitative researcher, ensuring its validity.

With 40 years of experience conducting clinical interviews—including work with pharmacists in multidisciplinary teams and complex, semi-structured family meetings—the PI's background contributed to the depth of qualitative insights, obviating the need for pilot interviews. A total of ten interviews were deemed achievable for a single interviewer. Participants were anonymized for analysis (e.g., P8 refers to the eighth participant). Aiming for rich, detailed data, the transcribed interviews were analyzed using grounded theory followed by reflexive thematic analysis. This approach, combined with triangulation from the broader research team, ensured robust interpretation and sufficient informational depth.

The interviews were conducted between November 2019 and November 2021, with each session lasting approximately one hour. At the beginning of each interview, the PI outlined his extensive background in road safety, first as a rural general practitioner conducting mandatory driving licence medical checks and police-requested driver assessments, and later as a palliative care specialist who frequently fielded questions from patients on opioids about potential effects on driving. Participants were asked questions such as:

- Did your undergraduate or postgraduate education include specific instruction on "medications and driving"?
- Do you routinely inquire whether a patient drives?
- Have you ever contacted a patient's GP or referred them back to a physician or licensing authority regarding driving?
- How would you respond if you believed a patient could not drive safely?
- Given that GPs conduct most driver medical assessments, do you consider them the most appropriate professionals for this role?

Field notes were taken throughout the interviews, and additional details were added upon reviewing audio recordings and transcripts. Specific statements from participants were coded and then organized into subthemes and overarching themes through iterative discussion with the research team. The analysis followed Braun and Clarke's six-step approach—data collection, initial coding, theme identification, refining and naming themes, and reporting—applied in a reflexive, non-linear manner [26, 27].

Results and Discussion

Ten pharmacists participated in the study: seven women and three men, all previously unknown to the PI. Ages ranged from 21 to 61 years, with a median age of 31. Their professional experience spanned 1 to 35 years, with half having fewer than ten years in practice. Participants consistently identified the primary PDIM categories, aligning with medications noted in the Victorian autopsy study of MVC fatalities: opioids, antidepressants, benzodiazepines, and antipsychotics [19]. When asked about formal education on drugs and driving, none recalled receiving training, with one senior pharmacist (P8) summarizing the group's experience as mostly "on-the-job learning."

Through reflexive thematic analysis, three main themes and one minor theme emerged from the dialogue: (1) balancing road safety with personal freedom and independence; (2) collaboration and communication with GPs; (3) variability in guidance on opioid-related impairment and tolerance; and (4) the "elephant in the room." These themes arose naturally from participants' responses rather than from direct questioning, with at least two participants contributing to each theme.

Balancing Road Safety with Freedom and Independence

This theme encompassed participants' perceptions of medication effects, patient quality of life, and licensing concerns. Several pharmacists expressed apprehension about the impact of medications on driving, using the phrase "signing off" to describe authorizing a patient to retain or obtain a driving license:

P3: "It's probably underestimated how much medications can affect someone's driving."

P4: "It's concerning to think about what some people might be taking while on the road."

P10: "I've seen patients who could barely walk in the door still driving. I don't think they should be behind the wheel, yet doctors still clear them to drive—I don't understand how."

Regarding patient quality of life, some pharmacists acknowledged the emotional and practical significance of retaining independence through driving:

P10: "Driving represents independence for them, and holding onto that is important."

P6: "Nobody wants their licence taken away; it removes freedom and autonomy."

Team Approach and Communication with GPs

Pharmacists generally agreed that GPs are the most appropriate professionals to oversee driver licensing and monitor patients' fitness to drive, but many highlighted that improvements in collaboration would be beneficial:

P1: "Pharmacists should be involved when patients are taking multiple medications."

P3: "It really ought to be a team-based approach."

P4: "A more collaborative system would definitely help."

P10: "Incorporating pharmacists into general practice—something that's currently being trialed—could provide an excellent opportunity for joint management."

Communication with GPs emerged as a prominent theme, though the quality of interactions varied considerably.

P10: "If pharmacists could communicate more openly with doctors, community outcomes would improve. I worry about OMDs causing harm or fatalities."

P7: "GPs could coordinate more actively with other healthcare providers."

Participants reported a spectrum of experiences, from effective communication to poor or even absent contact with GPs. P1 noted that "around 90% of doctors are at least willing to discuss concerns via email or fax," yet the same participant described having to escalate a case to the health ombudsman because a GP ignored calls regarding a patient misusing benzodiazepines. P4 recounted calling a GP about a medication-impaired driver, but action was only taken after the patient had a minor collision in the pharmacy car park. This participant also reflected on mixed experiences: "Some doctors are very receptive and willing to listen," while "there are a few who, though technically reachable, you'd avoid bothering unless absolutely necessary."

Other participants described feeling uncertain or lacking feedback when attempting to contact GPs about driving safety concerns.

P6: "You rarely get any response from GPs. I certainly wouldn't try to contact a specialist—they're virtually impossible to reach."

P9: "After another client reported a heavily medicated patient for questionable driving, I felt I should contact the doctor, but honestly, I wasn't sure if I should."

Two participants (P5 and P8) had prior experience in the opioid maintenance therapy (OMT) program, which provides methadone or buprenorphine two to three times weekly for individuals recovering from opioid use disorder. Both reported that communication with GPs in the context of this program was generally effective.

Varying Scope of Advice on Opioid Impairment and Tolerance

Medication Impairment Guidance

Pharmacists varied in how they provided advice regarding the cognitive and driving-impairing effects of opioids. For example, P1 noted that age influenced the guidance they offered:

"No, I probably don't usually ask whether someone drives," P1 explained. "With older patients, I tend to mention that they may be more susceptible to impairment. For someone closer to my age [30s], I might say that depending on how they respond to the medication, they could be fine—but it's really a wait-and-see approach."

When asked whether they tailored advice more for older patients than younger ones, P1 replied:

"Yes, I consider their other medications and ask about the reasons for their prescriptions. If they have conditions that might impair them, I may advise against driving a bit more strongly, but ultimately, I leave the decision to them. They need to make their own judgment."

P4 reported occasionally asking patients if they drive, noting: "Sometimes I ask, yes. Other times it's obvious whether they drive or not." Most pharmacists discussed common impairing side effects, such as drowsiness, even without confirming if the patient was a driver. For patients on repeat prescriptions with stable long-term opioid doses, advice about impairment was often not reiterated.

For short-term opioid use, guidance was generally appropriate—patients were advised not to drive for at least four hours after taking the medication. However, recommendations were less clearly defined for patients with prior opioid exposure. P9 described their approach:

"When someone comes in with an Endone prescription, it depends on whether they've taken it before. If they have, I ask how it affected them previously. If they report minimal drowsiness, I still remind them to be cautious because the response can vary. For first-time users, I spend more time explaining the effects, particularly drowsiness."

P9 added: "For first-time users, I explicitly tell them not to drive for at least four hours after taking the medication."

Advice regarding long-term opioid use was less consistent and frequently discussed in terms of tolerance. Pharmacists mentioned a wide range of timeframes for tolerance development, from one week to several months. Some also highlighted that alcohol could amplify the sedative effects of opioids and other PDIMs.

During interviews, participants shared insights into how they advise patients about driving while taking sedating medications:

Facilitator: "For medications like benzodiazepines or opioids, would you warn patients about sedation?"

P10: "Yes, I tell them that if they feel affected, driving isn't recommended. Some long-term users don't experience drowsiness, so they feel fine. I usually don't repeat the

warning every time, but if the dose changes or increases, I make sure to remind them."

Facilitator: "And what about longer-acting opioids?"

P10: "I normally advise patients to observe how they respond to the first dose. For example, they shouldn't drive on the same day or the next day initially. Based on how it affects them, they can then judge whether driving is safe."

P1: "Ultimately, the patient has to assess their own level of impairment and decide if it's safe to drive."

P3: "With PDIMs, I usually advise people to see how they respond to drowsiness in the first few doses."

The Elephant in the Room

Pharmacists highlighted that while cognitive side effects of opioids were discussed with patients, driving impairment was rarely addressed directly. Two mid-career pharmacists emphasized that patients seldom raised driving as a concern:

P6: "In nearly 20 years, no one has ever asked me, 'Do you think I can drive on this opioid?' Acute users know they'll be at home for a couple of days, while long-term users must manage daily life, including driving. There are obviously many people on long-term opioids."

P7 (with experience in both community and hospital pharmacies): "To be honest, the topic of driving while on drowsy medications comes up very rarely."

The increasing detection of opioids in drivers involved in MVCs is concerning, suggesting a potential causal role. Pharmacists are aware that opioids and other potentially driving-impairing medications (PDIMs) can compromise driving ability, posing serious risks to road safety, sometimes even raising doubts about a physician's decision to authorize driving privileges. Pharmacists may encounter the ethical challenge of dispensing PDIMs while simultaneously witnessing impaired driving associated with these drugs. Some pharmacists expressed empathy toward patients who risk losing their driver's licence, recognizing the resulting decline in quality of life (QOL).

To address these concerns, many pharmacists are willing to assist by advising licensed general practitioners (GPs) regarding medications. Although they generally acknowledged that GPs are best positioned to determine driving fitness, about half of the participants considered it essential to have a patient's pharmacist involved in the GP licensing process. A significant barrier to this collaborative approach was identified as the absence of standardized, transparent communication with GPs. One mid-career pharmacist reported finding it largely ineffective to attempt contacting a GP. In contrast, an early-career pharmacist described the uncertainty of whether to reach out to a GP without clear guidance. Other pharmacists indicated that communication with GPs was generally satisfactory but could recall instances of poor interactions. Subtle critiques of GPs emerged during interviews, suggesting that pharmacists are willing to strengthen relationships even with doctors perceived as more challenging to approach. Pharmacists who had experience in the opioid maintenance treatment (OMT) program highlighted the rapid and effective communication with GPs in this structured environment, demonstrating that collaborative partnerships are feasible when adequately supported.

Regarding the recommended abstinence from driving after starting opioids, participants offered variable guidance, often summarized as "see how you go," typically after one or two days for patients on long-term opioids. Frequently, patients receiving opioid therapy were not asked about driving habits but were advised that the medication "may cause drowsiness; don't drive if affected." Some pharmacists also tailored advice based on a patient's age. Research by Fukuda *et al*. [27] investigating the effect of warnings on Japanese drivers suggested that indirect communication reduces the influence of safety information on driving behavior. According to Austroads' driving guidelines, pharmacists and GPs are expected to explain the potential effects of opioid medications on driving [14].

Media reports regularly highlight the role of medications in MVCs [28-32], with opioids being the most frequently implicated in fatal crashes [33]. It is notable that two mid-career pharmacists, one with seven years and another with thirty years of experience, had never been questioned about medications and driving. This aligns with prior research on chronic non-cancer pain (CNCP) patients, where discussions of opioids and driving were often not initiated by either healthcare professionals or patients [7]. For pharmacists in our study, a contributing factor may have been limited formal education on this subject.

Strengths and Weaknesses

The study targeted ten participants, a decision made after consultation with the research team. While some authors suggest that a sample of ten may achieve thematic saturation, as noted by Hennink *et al*. [28], Braun and Clarke [29] argue that saturation may be neither practical nor meaningful in a fully reflexive thematic analysis. The study possesses several qualities identified by Malterud *et al*. [30] as "information power," as the cohort was particular and relatively homogeneous, and explored a novel area. However, reliance on a predetermined convenience sample limited the precision of this concept. Most pharmacists approached were willing to participate, with only one declining due to time constraints. Although five pharmacies represent a substantial portion of the 40 available, including more pharmacists might have increased variability in responses and reduced homogeneity.

Conclusion

Pharmacists play a role in promoting road safety by advising patients on the cognitive-impairing effects of opioids and other PDIMs when dispensing these medications; however, their impact could be enhanced if guidance explicitly addressed potential effects on driving. Pharmacists are aware of drugs that may impair drivers and, in some cases, have directly observed drug-related driving impairment, but currently lack a consistent channel to communicate this to GPs. The recommendations they provide to patients regarding abstaining from driving do not always align with their understanding of tolerance development to opioid-induced cognitive effects. Facilitating structured communication with GPs through a formal role in licence assessment, coupled with additional pharmacist education on opioids, would better equip pharmacists to deliver targeted advice to both opioid-medicated drivers (OMDs) and GPs assessing licences. Offering focused guidance to OMDs, often addressing the so-called "elephant in the room," could enable more informed self-assessment of driving ability, ultimately enhancing road safety and reducing MVCs associated, fully or partially, with PDIMs, particularly opioids.

While these findings corroborate previous research highlighting an information gap between patients and health professionals regarding opioids and driving, this study is novel in demonstrating that many pharmacists are eager to actively contribute to bridging this gap.

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