Title: **Mitigating opioid errors in inpatient palliative care: a qualitative study.**

Running Head: Mitigating opioid errors

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Abstract

Background: Opioids are a high-risk medicine used in high doses and volumes in specialist palliative care inpatient services to manage palliative patients' pain and other symptoms. Despite the high volume of opioid use in this care setting, serious errors with opioids are exceedingly rare. However, little is known about the factors that mitigate opioid errors in specialist palliative care inpatient services.

Aim: To explore palliative care clinicians' perceptions of factors that mitigate opioid errors in specialist palliative care inpatient services.

Methods:

Design: A qualitative study using focus groups and semi-structured interviews**.**

*Participants and setting***:** Registered nurses, doctors, and/or pharmacists ('clinicians') who were involved with and/or had oversight of the services' opioid delivery and/or opioid quality and safety processes, employed by one of three specialist palliative care inpatient services in metropolitan NSW.

Findings: Fifty-eight participants took part in this study, three-quarters (76%) of which were palliative care nurses. A positive opioid safety culture was central to mitigating opioid errors in specialist palliative care inpatient services. This culture of opioid safety was founded on clear and consistent safety messages from leadership, clinicians empowered to work together and practise safely, and a non-punitive approach to errors when they occurred. The clinical nurse educator was seen as pivotal to shaping, driving and reinforcing safe opioid delivery practices across the palliative care service.

Conclusion: Creating and sustaining a positive opioid safety culture, and promoting a non-punitive approach to opioid error and reporting, is essential to mitigating opioid errors in the specialist palliative care inpatient setting.

Key words: Analgesics, Opioid; Hospices; Medication Errors; Palliative Care; Patient Safety; Safety Management.

Summary of Relevance

Problem: Opioids are a high-risk medicine with the potential to cause serious patient harm when errors in delivery occur.

What is already known: Opioids are used in high volumes and doses in specialist palliative care inpatient services yet serious patient harm in this setting is exceedingly rare.

What this paper adds: This is the first paper to explore opioid error mitigating factors in the specialist palliative care inpatient setting. This study identified that a positive opioid safety culture, and opioid education tailored to the palliative care context, is central to supporting palliative care clinicians to safely delivery opioids.

Background

Patient safety underpins high quality care across all healthcare settings (Institute of Medicine, 2000). Palliative care patients' fragility, comorbidities, significant symptom burden, and the need for input from multiple healthcare providers, places them at greater risk of exposure to and harm from medical error (Dy, 2016; Myers & Lynn, 2001). Medical error at the end-of-life can impede treatment goals and the provision of comfort measures, considerably adding to the distress and suffering of patients and their caregivers (Casarett, Spence, Clark, Shield, & Teno, 2012; Dy, 2016). Hence, there is a growing focus on patient safety within specialist palliative care (Casarett et al., 2012; Dietz, Borasio, Schneider, & Jox, 2010).

The burden of pain experienced by palliative patients can be considerable, as such, the timely and effective treatment of pain is a palliative patient safety priority (Dy, 2016; Shekelle et al., 2013). Opioids are routinely used in palliative care services for the management of pain and other symptoms (Australian Adult Cancer Pain Management Guideline Working Party, 2014; Therapeutic Guidelines Limited, 2016). These high-risk medicines, have a heightened risk of causing patient harm, injury or death when errors in opioid delivery occur (Institute for Safe Medication Practices, 2012), and are the most frequently reported drug class causing patient harm (Clinical Excellence Commission NSW Health, 2018; Dy, Shore, Hicks, & Morlock, 2007). As a result, specific strategies targeting safe opioid delivery are widely employed in the health care setting (Australian Commission on Safety and Quality in Health Care, 2018; Colquhoun, Koczmara, & Greenall, 2006; Institute for Safe Medication Practices, 2018), many of which are reflected in mandated medication handling policies (Ministry of Health NSW, 2013, 2015).

Compared to other healthcare settings, opioid delivery for the vast majority of palliative care patients includes: multiple opioid orders and formulations, including regular and as needed ('PRN') orders, often administered via different routes (Heneka, Shaw, Rowett, Lapkin, &

Phillips, 2019). There is a higher frequency of opioid delivery in inpatient palliative care services than in the acute care setting, with considerably higher opioid doses also used compared to all other healthcare settings (Australian Institute of Health and Welfare, 2018; Heneka et al., 2019).

Despite the high frequency and high doses of opioids used in specialist palliative care inpatient services, serious patient harm due to medication errors with opioids is exceedingly rare (Heneka, Shaw, Rowett, Lapkin, & Phillips, 2018a). Additionally, palliative care clinicians perceive the prevalence of opioid errors in specialist palliative care inpatient services to be low, given the high frequency of opioid delivery in this setting. While factors contributing to opioid errors in inpatient palliative care services are becoming better understood (Heneka, Shaw, Rowett, Lapkin, & Phillips, 2018b; Heneka et al., 2019), little is known about the factors that mitigate opioid errors in these services. Identifying opioid error mitigating factors is essential to better understand how to foster and support safe opioid delivery in specialist palliative care inpatient services.

Aim

To explore palliative care clinicians' perceptions of factors that mitigate opioid errors in specialist palliative care inpatient services.

Methods

Design

A qualitative study using focus group and semi-structured interviews**.**

Participants

Registered nurses, doctors, and/or pharmacists ('clinicians') employed by a specialist palliative care inpatient service, who are involved with and/or have oversight of the services' opioid delivery and/or opioid quality and safety processes.

Setting

Three inpatient palliative care services in metropolitan New South Wales: two 40-bed palliative care units; and a 20-bed unit.

Ethical approval

This study was approved by the St Vincent's Hospital Human Research Ethics Committee (LNRSSA/16/SVH/321) on December 7, 2016.

Recruitment and data collection

Details of recruitment and data collection have been reported in detail elsewhere (Heneka et al., 2019). All participants provided informed, written consent. A question guide informed by the literature (Heneka, Shaw, Rowett, & Phillips, 2015) and piloted with palliative care service managers and medication safety experts, guided the focus groups and semi-structured interviews (Table 1).

[Insert Table 1]

Data analysis

Inductive thematic data analysis (Braun & Clarke, 2006) was employed for this study. Initial data coding was guided by the focus group/semi-structured interview questions, with codes and collated data examined for potential themes. To ensure rigour, the preliminary themes were identified independently (NH and JLP) and refined through collaborative analysis until the final themes and sub-themes were confirmed. All transcriptions were read in conjunction with the original audio recording (NH) to check for accuracy. Data familiarisation was achieved through multiple readings of the transcripts and field notes (NH). The procedures used to ensure trustworthiness of the data findings have been reported elsewhere (Heneka et al., 2019). The Consolidated Criteria for Reporting Qualitative Research (COREQ) has guided the reporting of these findings (Tong, Sainsbury, & Craig, 2007).

Findings

Fifty-eight clinicians participated in this study, comprising nurses (n=44, 76%), physicians (n=12, 21%) and pharmacists (n=2, 3%). Participant demographics and details of focus groups/semi-structured interviews have been previously reported (Heneka et al., 2019). Clinicians' perceptions of factors that support safe opioid delivery in inpatient palliative care services are described in four primary themes and six subthemes as summarised in Table 2.

[Insert Table 2]

Participant key: CNE: Clinical Nurse Educator: NUM: Nurse Unit Manager: RN: Registered Nurse.

A positive safety culture underpins safe opioid delivery

Participants overwhelmingly described the existence of a positive opioid safety culture in their services, which they perceived to be fundamental to preventing opioid errors and supporting safe opioid delivery. Opioid safety culture was linked to four central factors: i) clearly communicated and consistent expectations from management regarding safe opioid delivery; ii) a culture of empowering clinicians to practice safely; iii) interdisciplinary teamwork; and, iv) establishing and promoting a non-punitive error reporting culture.

Clear expectations regarding safe opioid delivery

For unit managers, acknowledging the high volume use of high-risk opioids, and privileging the importance of consistent, safe, opioid delivery, underpinned the services' approach to opioid safety:

> *We've said that because we do so many (opioids) instead of expecting that we would, as a result of that, have a high rate (of errors), we've said…we should be experts at it and we should be the best at it. Which is another change in cultural focus. I think we've continued to raise the*

profile in suggesting that it's (opioid delivery) a really pivotal part of what we do. I think it's that culture of, 'this is important' (ID33_NUM).

Participants reflected on the importance of 'a top down approach', with management taking a lead role to promote awareness of opioid delivery policies, and consistently communicating and enforcing their expectations regarding safe opioid delivery. Participants also noted that the consistent messages from management regarding how opioid delivery policy was implemented, was vital to upholding safe opioid practices within the unit:

For me [the safety culture] is from the top down, definitely management has a huge influence on the culture…everyone is aware of what is going on and wants to be sure that the right thing is being done…(it's) all consistent, that's what I've noticed, everybody does it the same; it's not just one person that does it this way, everyone is doing it the same, that's what I think is great (ID47_RN).

The ever-present risk and potential consequences of an error during opioid preparation was readily identified by participants. Participants stressed that, fundamental to safe opioid delivery, was the importance of respecting both the opioids, and the opioid delivery process itself:

We missed a drug when we were making up (an infusion pump), and there was a thousand things that happened that day, but it just made me realise that…when we do these breakthroughs, and we're dealing with the (opioids) that this is really important - actually, we're not going to talk right now because I'm doing a pump; and sometimes I think…that we deal with such huge doses that sometimes you get a bit blasé with the doses that you're dealing with, and it was a really good reminder for me…make sure you're focused on only giving the drugs…give these drugs the respect they deserve (ID37_RN).

It was acknowledged that a positive safety culture required a multi-faceted approach encompassing situational awareness, vigilance and a non-punitive, organisation wide commitment to upholding safety culture:

> *It's that combination of alertness, awareness, everyone being aware of inexperience, and an open, blame-free culture (ID09_Physician).*

Empowering clinicians to practise safely

Participants reflected on the positive impact of a culture that empowered and reinforced the need to practise safely in accordance with each clinician's professional responsibilities, especially when dealing with opioids. These participants recognised that opioid errors harmed the patient and the clinician:

> *Preventing the errors is a safeguard for us as well as the patient…it's a safeguard for our professional registrations as well; if you're a registered nurse, it's just part of your professional responsibility to make sure that you maintain your standards (ID43_RN).*

Mandated policies for opioid handling/management were seen as very effective in reducing opioid errors when policies were strictly adhered to:

> *We're very strict…and again, it's just policy. We've had a lot of new staff start over the last year or two, and I think because they've come into that culture as existing, with all the strictness around doing things the right way (following policy)...that's the funny thing, we're just doing it the right way, it's not like we're re-inventing the wheel (ID35_NUM).*

Adherence to opioid delivery policies was perceived to be strengthened by a service culture that supported clinicians to challenge each other if policy non-compliance was identified:

I think we've empowered our staff to feel comfortable in doing things the right way, and challenging people if they don't want to do it the right way…at the end of the day, you're responsible for your registration…if something goes wrong and you're in a court of law, nobody's actually going to back you when (you didn't follow) policy (ID34_CNE).

Participants consistently acknowledged the power of a positive service culture that created an expectation of opioid adherence to ensure safe opioid delivery. This positive culture enabled them to feel confident, safe and supported, to challenge any perceived or actual opioid policy breaches, and for many this was in stark contrast to their previous experiences:

I came from a culture where it was like…why would two people go to a bedside? But here, really promotes that...I'm very confident now in saying 'you actually need to come with me'…because really, the culture now is that you just don't do that, and I've never been in a unit before where it's been like that (ID37_RN).

Participants noted and reflected on the differences between palliative care and other services, in relation to opioid safety, noting that the expectations and enforcing of independent double checking standards were much higher in the palliative care service compared to units they had previously worked:

I've never worked anywhere that's been so thorough checking their (opioids) (ID48_RN);

No, neither have I, and I've got 30 years nursing experience. It's keeping me safe and the patients safe, and that's what I like about it (ID42_RN).

Working as a team

Effective inter-disciplinary team work was central to opioid safety and contributed positively to safety culture. The complexity of opioid prescribing and administration meant that participants relied on, and expected, that their interdisciplinary colleagues worked diligently to ensure all opioid orders/administrations were correct, or were open to being challenged. Participating physicians stressed that, from the medical perspective, inter-disciplinary team work in palliative care was essential to '*enable the nurses to do their job*' *(ID51_Physician)*. They described actively encouraging nurses to question orders they felt were incorrect: '*…if it's wrong, I'm happy to be questioned*' *(ID55_Physician)*; and all physicians noted they routinely consulted with nurses to check opioid orders:

> *When I'm calculating something, if it's particularly complex or warrants double checks I often ask one of the nurses, what do you think?' (ID56_Physician).*

Similarly, nurse participants described how they were confident querying opioid orders they perceived to be incorrect, or initiating discussions about changes to patients' opioid orders:

> *So I said to the doctor, are you sure this is what you want? I think the intention was (for administration) today, but they re-charted it for tomorrow morning…they're human too…if we see something, we question it. I think we're spoiled here, that we do have a good relationship with our doctors (ID48_ RN).*

Participants from services with full-time palliative care pharmacists greatly valued and noted the high level of interdisciplinary collaboration their presence afforded, particularly in regards to opioid management:

> *We're really fortunate that we have pharmacists on site, they're very open to anybody spending time with them, clarifying anything, if the doctors are*

not here and the nurses are uncertain about why the breakthrough dose is such as it is (ID34_ CNE).

From the pharmacist's perspective, an important outcome of the tasks they routinely undertook, such as opioid order review, management of opioid supply, and targeted opioid education, was a reduction in workload, particularly for palliative care nurses:

A lot of what we do…also helps the nursing staff, it reduces the workload, to me that's very important to assist them (nurses) in that way, reducing their workload, (as) they have plenty to do (ID40_Pharmacist).

Promoting a non-punitive approach to error

Creating and promoting a non-punitive error reporting-culture was a key strategy each service had adopted to support opioid safety. Error-reporting was seen as an opportunity to improve individual and unit performance, and also critically assess and identify potential systems failures that may be contributing to error:

We work in a unit where we certainly want to identify errors, but we don't want to take a punitive approach to the error…it's not about dragging that person over the coals, it's very much about improving performance, improving patient safety and then looking at the system and saying 'is there something more than just talking to the individual about what we're going to do here?' (ID32_Physician).

It was also acknowledged that a punitive reporting culture has a negative impact on, and was counter-productive to, a positive safety culture:

I think there have been some times when it was a bit more punitive than supportive if you know what I mean, and it always had a negative effect on the culture (ID16_Physician).

Transforming a punitive culture into a positive reporting culture was noted by multiple participants to require significant and sustained effort. Participants, especially those in leadership or management roles, described the steps they had taken to transform the error reporting culture over time. This extended to reinforcing the importance of opioid error reporting, and supporting clinicians to identify and report errors:

> *…creating a safe reporting culture…and having a safe conversation together, so me making them feel safer, less vulnerable professionally over a period of time didn't come easy, but over time, I think it's pretty much going okay now (ID57_ NUM).*

Ultimately, participants perceived that having a positive safety culture within their services, promoted a culture of error reporting:

> *I don't think we have a culture where we're frightened to report anything. I don't think we have a culture where we're afraid to own up to any mistakes… I think we're all accepting of each other, and if a mistake is made, you have to do something about it, and I don't think there's a culture of shielding that (mistakes) from management (ID47_RN).*

Opioid error reporting is encouraged and expected

Participants perceived that opioid errors, on the whole, were quite accurately and routinely reported, compared to other medications:

> *…with opioids, it's more serious, we have to do a report…I'm pretty sure that all opioid errors would be reported (ID18_RN).*

This was perceived in part, to be related to palliative patients' needs, whereby their medication orders are routinely reviewed by multiple clinicians over the course of the day:

There's enough eyes looking at the medication chart over a period of 24 hours to think that we are, hopefully, reporting them all (ID16_Physician).

Participants also suggested that the mandated 24 hourly checks of the drug book helped identify opioid administration errors, which were subsequently reported:

If it's not the person making the mistake reporting it, someone else will; the next shift might pick up a mistake, they might see something in the drug book doesn't correlate and they'll report it; or they'll tell our manager and the manager will report it (ID14_ RN).

While the overwhelming majority of participants perceived that the unit had a positive and supportive error reporting culture, a very small number of participants described how they were sometimes reluctant to report an opioid error as they did not perceive the reporting culture in their service to be non-punitive:

…the problem I think with reporting is it becomes a bit of a blame thing…once it's reported…it seems like someone also has to have the blame (ID08 _RN).

Despite this reluctance, error reporting culture was considered a key element of opioid safety, with participants suggesting that reporting more errors did not necessarily reflect poor practice, but rather a positive safety culture:

I've certainly seen that elsewhere…that it reflects badly on the unit, the more incidents you have. It doesn't look good, so you're not encouraged to (report) in other places, but they do encourage it here, to help highlight the issues so that we can rectify (ID25_ RN).

Rectify or report?

Mandated policies related to opioid management, such as independent second person checks prior to administration, were perceived to routinely intercept potential errors:

> *…our safety checks pick up a lot of those (opioid) errors before they actually happen (ID09_Physician).*

In contrast to opioid administration errors, participants suggested that not all opioid prescribing errors were reported. This was primarily because nurses in particular, were more likely to try to rectify prescribing errors first, and, if the error was promptly rectified, were unlikely to report the error:

> *Generally if I find a prescribing problem you just go and get (the doctor) to fix it, you don't put a report in (ID18_ RN).*

Participants suggested that prescribing errors were readily fixable, and timely administration of the correct opioid order, and effective pain management, was the priority for this patient population:

> *I think often you can rectify the problem quite simply…you go to the doctor to change it, so, rather than report it, it's quicker just to fix it; I think we don't report it because it's fixable…we report falls and pressure areas because we can't fix them on the spot but if it's a medication error we just go and get the chart fixed, and it's done (ID45_ RN).*

Participants perceived that errors intercepted during the mandated two-person check, and before reaching the patient (‘near misses’), are rarely reported, re-iterating the purpose of the independent double check for minimising opioid errors:

> *If you went to give it (opioid) and one of you decided ‘oh that’s the wrong patient’, that would be rectified, that’s why you’ve got two people, and I*

don't know that that would be…that may happen, and it wouldn't ever be reported (ID06_ RN).

The exceptions were: i) incidents which resulted in a narcotic discrepancy (e.g., wrong opioid drawn into syringe and/or opioid discarded), which were promptly reported; and ii) incidents where clinicians were: '*not happy to give (the medication)*' *(ID04_RN)* after identifying an error, for example, an opioid order is wrong, or a wrong drug has been taken to the bedside:

If your double checking identifies something before you've drawn it all up and are going to give it then you've prevented it from being a problem, but I guess if someone's actually willing to go and take it to the patient, and there's the potential it would have been given without resistance, that would be reported (ID05_RN).

Reflecting and learning from error

For the majority of participants, error reporting was seen as an opportunity for the clinician involved to reflect on practice, and the service to identify potential systems deficits:

If someone identifies that they missed something and they report it, then you're reflecting on your own practice…I think you're going to be much more vigilant, just from reporting it. Then the (service) follow through also happens. It's viewed in a constructive rather than a punitive fashion…but we do want vigilance around it (ID32_Physician).

Participants stressed '*we're not blasé about mistakes, everyone takes it really seriously*' (*ID38_RN)*; and several participants reflected on their own experiences with opioid errors at a personal and professional practice level. Participants who shared examples of opioid errors they had made universally described great distress and spoke of how the experience had strengthened their commitment to the required safety processes:

I think those of us, personally speaking, who have made a drug error with an opioid, then you know you never ever do it again. It was scary at the time. I thought, "Oh my God, I think I'm having a heart attack" but everyone was okay. It was fine. The patient was okay. The family was okay. At the time, I was like, "I think I'm going to die." But you never do it again. You triple check. You quadruple check (ID61_RN).

Participants also shared how they had self-reported opioid errors and reflected on how their practice changed following an opioid error:

I've reported myself on an (opioid) error that I've made and…I was mortified by the error, it just changed my practice…I've never felt that somebody from above has come down on me in a punitive way, and I have changed or bettered my own practice because I've been so upset that I've made an error that I'm fairly sure I would not do that again (ID06_RN).

Education is empowering

Participants highlighted the importance of education targeting opioid use in the palliative care context as a strategy to reduce error. While each clinician was responsible for adhering to opioid practices, investing in the clinical nurse educator ('CNE') role was seen as pivotal to instilling and reinforcing safe opioid practices:

I think (the CNE) has played a really big role in…giving nurses a really good base for practicing safely. They realise and understand that they're responsible and they're at risk if they don't follow those basic rules…I think (they're) empowered to be able to understand that by practicing safely they are also protecting themselves (ID41_Pharmacist).

All services provided a comprehensive orientation program for new clinical staff with a substantial focus on opioids. New palliative care nurses routinely spent one-on-one time with the clinical nurse educator to familiarise themselves with the intricacies of opioid administration as part of orientation:

> *When I first started here, [the CNE] was with me for at least a couple of days…at first it was like, 'oh my gosh, I've got so much to learn, I'd better pay attention'; that's another sort of safeguard because she went through things as an educator, everything was explained at that time – 'this is how we do it', just so it becomes a part of your everyday practices right from the start, that was really good (ID47_RN).*

In addition to investing in opioid education at orientation, each service invested in ongoing education, as exemplified in this quote: '…*there is a lot of education in regards to opioids*' *(ID20_RN)*. Participants described both formal (e.g., information sessions conducted by pharmacists; weekly tutorials for junior medical officers; one-on-one opioid conversion exercises with the clinical nurse educator), and informal education that occurred within the day to day operations of the service:

> *Informal education, obviously, happens all the time on the consultant teaching ward rounds. We usually have a combination of a registrar and a resident…if we know that it's a junior registrar combined with an inexperienced RMO, the consultants are on high alert, as are the senior members of the nursing staff, to be checking that things are okay, and to be alert for any possible issues to be reported back, so trying to be open, encouraging the junior doctors to know that there's no fear or blame, and that they should always ask, is part of the education process, too (ID09_Physician).*

Ongoing education was also seen as critical to instilling clinician confidence to safely handle opioids, challenge any perceived opioid errors, and to respond appropriately to identify opioid errors:

> *I think nurses are very happy to challenge orders…I think just learning about the opioid conversion, learning what that means and why it's important (makes them confident to challenge), so being empowered by education (ID34_CNE).*

Sustaining an opioid safety culture requires ongoing, targeted attention

While culture was seen as critical to supporting opioid safety, participants in managerial or dedicated patient safety roles spoke of deficits in safety culture in preceding years. Participants suggested that clinician's attitudes towards opioid safety from previous management had adversely impacted the opioid safety culture, and error prevalence, in the past:

> *There had been a culture of under reporting, and people believing that by reporting, you are getting your colleague in trouble, or if it didn't harm the patient you don't have to report it…unfortunately it was a culture that was supported by the (manager) so the staff didn't see anything wrong by under reporting…that's the culture that actually permitted more significant incidents to actually happen (ID31_RN).*

They also described how creating a positive opioid safety culture had required substantial changes to clinicians' attitudes and clinical practice, and ongoing, pro-active measures to sustain it. Clinician complacency was a common barrier each service had to manage when looking to improve opioid safety culture initially:

We've done a lot of work over two years…I think initially there was a complacency (about opioids)…the sheer volume made (clinicians) overconfident…people had a sense of corner cutting… (ID57_NUM).

Another critical part of strengthening the opioid safety culture was the open acknowledgement and management of opioid errors:

That was a big cultural shift…not only looking at processes and trends, but also raising the profile of (errors), so making it very important that if an error happens that we need to look at that…and talk about (errors) very regularly (ID33_NUM).

Discussion

Patient safety in palliative care is an emerging and important area of research (Dietz et al., 2010; Dy, 2016). Given the high volume of opioid use in the palliative care inpatient setting (Heneka et al., 2019), identifying opioid error mitigating factors in the palliative care context is timely. This qualitative study identified that a positive opioid safety culture is critical to instilling and supporting palliative care clinicians' adherence to safe opioid delivery practices, and central to mitigating opioid errors.

For the palliative care clinicians in this study, opioid safety culture was predicated on clear and consistent expectations from leadership, clinicians empowered to work together and practise safely, and a non-punitive approach to errors when they occur. The clinicians in this study illustrated that a positive safety culture is created when there are shared values, attitudes, competencies and behaviours that reflect the palliative care services' commitment to safe opioid delivery (Nieva & Sorra, 2003). These factors were perceived to be critical to instilling and supporting palliative care clinicians' adherence to safe opioid delivery practices, and central to reducing opioid errors in specialist palliative care inpatient services. This is an important finding as it is widely accepted that a positive safety culture is fundamental to

reducing or preventing errors in any healthcare setting (Hodgen, Ellis, Churruca, & Bierbaum, 2017; Institute of Medicine, 2000).

Safety culture has long been believed to be a predictor of an organisation's safety performance (Wakefield, McLaws, Whitby, & Patton, 2010). In a positive safety culture it is recognised that errors are inevitable, and the organisation works proactively to identify factors that promote error causing conditions and seeks to rectify them (Nieva & Sorra, 2003; Reason, 2008). In this study, opioid safety was prioritised by unit and patient safety managers who acknowledged the risk involved in opioid delivery, and privileged safe opioid delivery as a fundamental component of quality palliative care service provision. This was reflected in the discussion with frontline clinicians, who reported a high level awareness of opioid safety expectations from management, and felt compelled and supported to adhere to the policies for safe opioid prescribing and administration. When opioid errors did occur, a non-punitive error reporting culture promoted reporting, and supported clinicians to reflect and learn from the error. In turn, the service endeavoured to identify error contributory factors from a systems perspective and implemented targeted strategies to address these.

Safety culture and error reporting

A notable finding in this study was palliative care clinicians overwhelmingly positive perceptions of the error reporting culture in their services. Error reporting is an essential component of patient safety which facilitates individual and organisational learning from error, and the development of error mitigating strategies (Institute of Medicine, 2000). Critical to effective error reporting is a non-punitive error reporting culture, where clinicians feel safe to report errors without fear of repercussion or disciplinary action (Institute of Medicine Committee on Quality of Health Care, 2001; World Health Organisation, 2005).

Palliative care clinicians in this study strongly perceived that error reporting was encouraged and expected in their service, and stated they felt safe to do so. However, the non-punitive error reporting culture identified in this study differs from other studies in health care services

(Boyer, McPherson, Deshpande, & Smith, 2009; Castel, Ginsburg, Zaheer, & Tamim, 2015; Dincer, Torun, & Aksakal, 2018; Khalil & Lee, 2018). A Turkish study of palliative care nurses' perceptions of safety culture found almost half (48%) reported that hospital management response to an error was punitive (Dincer et al., 2018). These nurses perceived that errors reflected an inability to carry out their professional role and thought they would be judged by their peers and punished by management (Dincer et al., 2018). Similarly, a US study found palliative care nurses felt high levels of error reporting reflected negatively on their job performance, and error reporting was associated with subjective feelings of incompetence and guilt (Boyer et al., 2009). These starkly contrasting perceptions of error reporting culture in palliative care services may reflect the personal and/or professional drivers which are barriers to error reporting, or they may be attributable to differences in palliative care services' investment in creating an overarching positive safety culture.

In this study it was evident that a positive safety culture did not simply 'happen' in participating palliative care services. Rather, it required targeted and deliberate action, and took several years to establish (Institute of Medicine, 2000). Managers in this study, tasked with elevating the opioid safety culture within their service, spoke openly of the challenges in changing and re-building a culture of safety, and the importance of a non-punitive approach to errors when they occur. Factors such as complacency, entrenched clinical practice, leadership that did not prioritise patient safety, and/or a punitive error reporting culture, were some of the key obstacles that needed to be addressed in the creation of a positive safety culture. However, once established, the organisations' safety culture influenced perceptions of: what clinicians came to consider as 'normal' safety behaviour (e.g., two nurses go to the bedside to administer an opioid), what motivated clinicians to engage in 'safe' behaviours (e.g., clinicians feeling empowered to follow opioid handling policy), and the translation of safe behaviours into routine clinical practice (e.g., palliative care nurses intercepting opioid prescribing errors) (Grissinger, 2014; Weaver et al., 2013).

Palliative care nurses error interception practices

Palliative care nurses in this study were pivotal in identifying and intercepting opioid errors, particularly prescribing errors, before they reached the patient. Nurses' capacity to intercept and rectify prescribing errors has been noted to commonly occur in other inpatient care settings (Cullen, Bates, & Leape; Flynn, Liang, Dickson, Xie, & Suh, 2012; Rothschild et al., 2005). These actions may reflect nurses' commitment to prioritising patients' safety and comfort, and ensuring patient's pain management is not adversely impacted due to error (Hewitt & Chreim, 2015; McBride-Henry & Foureur, 2006).

One of the key facilitators of opioid error interception practices by palliative care nurses in this study was a supportive nursing practice environment. This was characterised by highly collaborative interdisciplinary relationships, supportive management, and organisational commitment to quality care (e.g., targeted opioid education and continuous quality improvement) (Aiken, Clarke, & Sloane, 2002; Flynn et al., 2012). Cohesive interdisciplinary teams are critical to patient safety in any healthcare setting (Committee on Quality Health Care in America, 2001; Firth-Cozens, 2001; Okuyama, Wagner, & Bijnen, 2014), and have been shown to increase the interception of medication errors in acute care (Flynn et al., 2012). In a high functioning interdisciplinary team, trust between clinicians is high (Firth-Cozens, 2001; Wittenberg-Lyles & Oliver, 2007). This was apparent for the palliative care clinicians in this study who pro-actively sought advice from one another if there was uncertainty about an opioid order, and were empowered to challenge and rectify opioid errors when they were identified (Firth-Cozens, 2001; Wittenberg-Lyles & Oliver, 2007). This level of collegial, interdisciplinary teamwork ultimately fosters the delivery of high quality, safe, patient care (Committee on Quality Health Care in America, 2001; Zwarenstein, Goldman, & Reeves, 2009), and was another key opioid error mitigating factor in specialist palliative care inpatient services.

Mitigating errors through education

The nature of opioid delivery in specialist palliative care inpatient services varies substantially from other healthcare settings (Heneka et al., 2019). Clinicians new to specialist palliative care inpatient services acknowledge the steep learning curve associated with opioid delivery in this setting, and experienced palliative care clinicians recognise the inherent risk of error with routine complex tasks such as opioid conversions (Heneka et al., 2019). Hence, another facet of organisational support for opioid safety in this study was reflected in the in-depth opioid education provided at orientation to the service, and through ongoing formal and informal education opportunities for all disciplines.

Clinicians in this study reported their confidence and ability to identify opioid errors stemmed largely from a solid opioid education, tailored to the specialist palliative care inpatient context. Notably, all palliative care services in this study employed a dedicated clinical nurse educator who was also pivotal in shaping, driving and reinforcing safe opioid delivery practices across the palliative care service. Additionally, palliative care pharmacists provided opioid specific education and ready support for any opioid related queries. Academic detailing (i.e., tailored clinical education provided peer-to-peer), is increasingly being used as a quality improvement tool, and is considered one of the most effective strategies to improve patient safety, particularly in conjunction with small group interactive education (Scott, 2009). Hence, the roles of the clinical nurse educator and pharmacist in the palliative care service are critical to supporting safe opioid delivery, which in turn, is essential to mitigating opioid errors in specialist palliative care inpatient services.

Strengths and limitations

A substantial number of palliative care clinicians from multiple disciplines participated in this study, enabling data saturation to be reached. This study has provided insights into opioid safety culture in specialist palliative care inpatient services, which has not been previously reported. Safety culture varies widely between and within organisations (Morello et al., 2013;

Pronovost & Sexton, 2005; Singer et al., 2003) hence, these findings may not be generalisable to other palliative care services/settings, or other healthcare services routinely handling high volumes of opioids.

Implications for practice and research

Assessing safety culture to identify areas of strength, and areas for improvement, is an essential first step for any specialist palliative care inpatient services considering strategies to improve the quality of care. Pro-actively embedding and sustaining a culture of opioid safety empowers specialist palliative care clinicians to practice safely. Exploring the inpatient palliative care setting to identify similarities and differences in safety culture across a greater number of services, including those in differing geographical regions is warranted.

Conclusion

Opioid safety is highly prioritised in specialist palliative care inpatient services. Creating a systems wide approach that supports palliative care clinicians to safely navigate the complexities of opioid delivery in the specialist palliative care inpatient service delivery context, and promotes a non-punitive approach to error occurrence and reporting, is essential to mitigating opioid errors in this care setting. Assessing safety culture within the specialist palliative care inpatient service to identify areas of strength and areas for improvement, is an essential first step for any palliative care services considering strategies to support and improve this aspect of care.

The roles of the clinical nurse educator and pharmacist appear to be pivotal in instilling and supporting safe opioid delivery, and this warrants further investigation. Further exploration of safety culture in palliative care services is also warranted to identify the similarities and differences in culture across a greater number of palliative care service types (e.g., community), including services in differing geographical regions.

Acknowledgements

The authors gratefully acknowledge and thank the service managers who supported and helped facilitate this study, and all the clinicians who took part in this study for the generosity with their time and willingness to share their insights.

This work was supported by an Australian Government, Collaborative Research Networks (CRN) programme scholarship (NH).

Conflicts of interest: none.

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Table: 1 Question guide for semi-structured interviews and focus groups

• What are the strategies (current and/or previous) used in this unit to prevent/reduce opioid errors? • Is there anything else you think helps support safe opioid delivery in this unit? • Is there anything you think could be done in this service to better support safe opioid delivery in this unit?

Table 2: Summary of study themes

Theme 1: A strong safety culture underpins safe opioid delivery
i. Clear expectations regarding safe opioid delivery
ii. Empowering clinicians to practise safely
iii. Working as a team
iv. Promoting a non-punitive approach to error
Theme 2: Opioid error reporting is encouraged and expected
i. Rectify or report?
ii. Reflecting and learning from error
Theme 3: Education is empowering
Theme 4: Sustaining an opioid safety culture requires ongoing targeted attention