Original research

Safe medication administration: Perspectives from an appreciative inquiry of the practice of registered nurses in regional Australia

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ABSTRACT

Registered Nurses (RNs) are regulated health professionals who are educated and accountable for safe medication administration (MA). Binding their practice are standards, policies, procedure and legislation. MA competence is taught and assessed during professional pre-registration education programs. However, different philosophies, theories and models are used by education providers making curriculum content disparate and competency frameworks diverse. Additionally, healthcare contexts are increasingly complex and clinical environments unpredictable. Competency models must respect contemporary practice. This paper focusses on the outcomes of Australian PhD research that combined Appreciative Inquiry (AI) principles with a qualitative study to identify MA safety strategies. In this 2-phase descriptive study, twenty RNs were observed then interviewed about their MA experiences. This paper discusses the interview findings. The participants explained how they assessed patient's needs and implemented strategies to administer medications safely. They presented their actions as being underpinned by a desire to do 'the right thing for the patient' despite their practice going beyond traditional procedural frameworks and not reflecting organisational protocols. Instead, they developed common strategies to enhance safe MA. The participants' described using clinical reasoning and patient-centredness during MA. This study contributes to the knowledge needed for future practice development by highlighting what works.

1. Background

Current healthcare environments present clinical challenges for Registered Nurses (RNs) who are required to administer medications safely. International, national, state and local policies, laws, regulations, codes, standards and guidelines govern the scope of nurses' education and practice to address matters of safety (International Council of Nurses, 2013; College of registered nurses of British Columbia 2015; Nursing and Midwifery Board of Australia, 2016). These regulatory frameworks authorise nurses to administer medications (International Council of Nurses, 2013) and require them to use knowledge and skills from their foundational education (Maginnis and Croxon, 2010) and their professional codes of conduct (International Council of Nurses, 2013) to be competent and safe practitioners (International Council of Nurses, 2012). The RN role is key to detecting and mitigating medication errors (Nursing and Midwifery Council UK, 2010; College of registered nurses of British Columbia, 2013). Indeed, patient safety and advocacy are largely perceived as the nurse's responsibility (Jennings et al., 2011; Advinha et al., 2014).

Aside from knowing their legal obligations, RNs must have pharmacological knowledge (Broyles et al., 2013), be competent in dosage calculations (Coben and Weeks, 2014), skilled in medication delivery (Weeks et al., 2013a,b) and able to assess medication efficacy (McKenna and Gigi Lim, 2014). Additionally, RNs need adequate resources to fulfil this role while managing the risks and consequences of errors (Nursing and Midwifery Council UK, 2010). Furthermore, for RNs to make accurate clinical decisions and meet their accountabilities, they need to be able to practice from a robust evidence base and focus on person-centeredness (Levett-Jones, 2013). But, person-centred care requires well-resourced staff and environments for making sound judgements (Benner et al., 2008; Levett-Jones, 2013) that are sometimes elusive in today's healthcare settings (Brady et al., 2009).

Additionally, complex workplace variables, advancing technologies, and nursing workflow factors increase risks of MA errors (Bourbonnais and Caswell, 2014; Orbæk et al., 2014). The rapidly changing clinical advances and technological changes (Wulff et al., 2011) demand that RNs expand their knowledge and technical skill of MA to keep up (Adhikari et al., 2014; Iacovides et al., 2014). For example,

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contemporary intravenous infusion pumps and medication dispensing devices are more complicated than their predecessors (Mason et al., 2014). As well, MA is not undertaken as a discrete task but interwoven into the multi-faceted responsibilities of RNs (Westbrook et al., 2011). Embracing this pace of technological change and embedding the practice transformations for person-centred approaches to care is expected (World Health Organisation, 2014). But, the potential for unanticipated cascading failures jeopardises patients and staff safety (Drach-Zahavy et al., 2014; Cloete, 2015). In brief, RNs have the critical task of managing patient safety within environments that are busy, under-resourced, sometimes dangerous, unstable and constantly changing (Brady et al., 2009).

Standard operating procedures are promoted to limit practice variables and reduce risk (Huang and Gramopadhye, 2014). For example, from the 1980's onwards an itemised list called the 5-rights of safe MA has been present in nursing literature. The items emerged in the 1960's from a study of medication errors (Barker and McConnell, 1961) published in pharmacy literature. The list formed the basis of 'the golden rules' of safe MA in nursing educational literature (McGovern, 1988, p. 34). The framework continues to be considered trustworthy for safe practice (Kim and Bates, 2013) even though in recent years, more 'rights' have emerged to address perceived inadequacies with the original five (Pauly-O'Neill, 2009; Elliott and Liu, 2010; Lin et al., 2014). Westbrook et al. (2010) describe the significance of the 5-rights as:

> The medication administration process is governed by standards and legal mandate. At the core of these standards are the '5 rights' (right patient, right drug, right dose, right time and right route). Despite these being an essential part of nurse's education, medication administration errors are frequent (p. 684).

So, while, the 5-rights framework is ubiquitous in MA competency models it does not guarantee error-free practice (Institute for Safe Medication Practices, 2007; Armitage et al., 2010). Medication safety requires more than just adherence to the standardised 5-rights. Nurses must be critical thinkers able to competently manage authentic clinical problems (Weeks et al., 2013a,b; Bourbonnais and Caswell, 2014; Martyn et al., 2014; Hewitt et al., 2015). Furthermore, the evidence of the 5-rights as the basis for best-practice is unsupported (Institute for Safe Medication Practices, 2007). Additionally, most studies of MA focus on errors (Brady et al., 2009) instead of functional aspects of practice. Recommendations from these types of studies have had limited success reducing errors (Lapkin et al., 2016).

Therefore, a different approach to exploring MA is warranted. Despite the evolution of nursing education and practice (Advinha et al., 2014), much of the knowledge about safe MA comes from biomedical science, legal and management perspectives (Gibson, 2001; Folkmann and Rankin, 2010). Publications prioritising these perspectives (Gatford and Phillips, 2011; Giangrasso and Shrimpton, 2013) are incomplete for nursing practice. Contemporary educational frameworks and research into MA by nurses needs to be from a disciplinary standpoint.

This paper discusses the findings from the interview phase of a more extensive PhD study where RNs were first observed and then interviewed about their experiences of MA.

2. Methodology

This descriptive, qualitative Appreciative Inquiry (AI) specifically sought to identify positive aspects of nursing practice that enhanced safety and facilitated effective person-centred MA in a hospital in regional Australia. Descriptive methods used in the interview phase aimed to 'generate meaning' from the participants' experiences of MA and 'make sense' of the findings from the previous observation phase (Richardson-Tench et al., 2014, p. 176). An AI conceptual framework acknowledges positive actions and assumes that every organisation has things that work well (Cooperrider et al., 2008). The AI framework was congruent with the study's aims and is sensitive to the complex and changing environments where MA exists (Trajkovski et al., 2013; Thorne, 2014). Moreover, there is synergy between AI constructivist methods and seeking practice strengths as the starting point for motivating and creating positive change (Cooperrider et al., 2008; Benner, 2013). Interviews gathered nursing narrative that is a credible process for accessing and generating discipline-specific knowledge to transfer valuable information from the past to present in theory and practice (Benner et al., 2008; Carroll, 2010; Thorne, 2014).

Purposeful recruitment found twenty RNs who were willing to be observed and interviewed. They worked in four acute care clinical settings (Emergency, Surgical, Medical, Intensive/Coronary Care) at a regional hospital in Queensland, Australia where MA was a core component of their role. The data collection was multi-phased: first, observation of the participants' practice of MA was recorded as field notes and researcher reflections and second, audio-taped semi-structured interviews were conducted. A researcher journal was also kept throughout the study, enabling reflection and recall of the study activities to enhance analytical proximity of the data and strengthen the logical connection between the data analysis methods and the conceptual framework (Richardson-Tench et al., 2014).

All audio files were transcribed verbatim into NVivo[10] enabling researcher ideas to be attached to the raw data and simultaneously coded (Richards, 2009). The researcher journal entries were also included in the iterative/thematic analysis that was managed through organising and coding meaningful sections of text (Richardson-Tench et al., 2014).

Two Human research ethics committees approved this study.

3. Findings

The interviews totalled nearly 20 h where participants shared their experiences of MA and discussed their actions captured during the observation phase. Early in the conversations, the participants were asked about the critical MA features of their pre-registration educational program. Following this discussion, reflective questioning was used to help the participants recall their observed MA practices. They were encouraged to explain their thought processes during their observed practice and link this to their educational foundations. Then they were asked to discuss their clinical decision-making, feelings, values and beliefs about MA. In the four themes presented below quotes are attributed to participants, N1 to N20.

3.1. The teaching

The interviews all started with participants focusing on medication errors. While I listened to these stories, I used phrases such as 'Can you tell me more about that?' to explore any solution-based approaches, prompting the participants to talk about the strategies they used for safe MA.

All participants were taught the 5-rights as the framework for MA safety. The rights were what they (N2 & N16) 'remembered the most' from their education. Participant N2 said, 'The 5-rights was a big thing', and N10 added, 'The R's [rights] are very important'. N12 recalled being 'grilled' about the rights, while N2, N7, N10 and N20 described

the rights framework as being 'drilled into them'.

Accountability for safe practice was the primary reason for needing to adhere to the rights framework. In general, participants discussed their knowledge of patient safety principles related to the 5-rights. Fear of failure and adverse outcomes was the most significant motivator of their practice. They discussed going beyond the 5-rights or replacing the framework with alternative strategies to do the right thing for the patient. For example, participants (N17, N18, N19) talked about developing relationships with patients because as N13 said, 'consulting the patient' was vital to medication safety. Omitting to ask identification questions did not necessarily contradict safe practice in cases where the patients were known to the participants. N1 summed up the perspective of all others about patient identification in saying, 'If I've already ascertained that that's my patient and that's who they say they are, then I don't ask them every single time'.

In the emergency department, the participants met numerous people not wearing an identification bracelet. The identification process with these out-patients was different. N2 explained that questioning the patient identity was usually not necessary because MA was often a continuation of an earlier encounter where the patient identification was confirmed. Instead, N2 consulted the patient about the medication, including gathering details about previous medications and educating on the actions of the present MA. N2 confirmed pre-hospital doses of medications by asking:

> Have you had this before? 'Have you had Panadol, Febridol, Panamax.' Yeah 'cos they'll say, 'No I haven't had any Panadol, but I've had two Panamax this morning…' 'Ok let's not give you this [prescribed paracetamol] then…' Same with Tramadol: 'Have you had Toradol, Tramal, Tramadol?

Reviewing the patient's medications was called the 'bigger picture'. N11 discussed being taught to consider the 'bigger picture' and 'delve into' patient data to check that prescribed medications are not 'contrary to the patient's condition'. N8 described this as 'getting yourself in the right frame of mind of what you're giving and why you're giving it and what you're expecting'. All participants remembered being taught to appraise the medication orders critically.

The participants recalled pharmacology featured in their education and said this enabled them to 'see the bigger picture'. They remembered learning the actions and clinical indication of medications. There was strong recall about being taught to think about MA critically. N8 summed up the participant's perspectives as:

> Critically think about what you're gonna give and why you're gonna give it and a rationale behind what you're giving and not just give it because it's ordered. We used to do a lot of scenarios in our labs. Like finding errors are on the med sheets and the drugs and checking them. So they'd make us critically think about what we were doing and why… Following-up. Documenting if it was effective or not effective … understanding the labs [blood chemistry]. Like with warfarin and vancomycin and knowing the things that you need to look for.

A patient safety focus was consistent throughout all interviews. N20 explained: 'They [the teachers] were always pushing the error side'. Unanimously the participants stressed that they were taught to identify and manage medication mistakes and errors. N7 expressed the safety focus as 'I want to make sure I get good outcomes for my patients, I don't want anything bad to happen to them'. N5 said: 'I wanted to get it right for the patient', and N12 said, 'I try to do the right thing'.

The participants discussed the role that clinical education played in the development of their professional competencies. N10 reinforced the need for nursing students to have good clinical experiences with expert preceptors for the effective transfer of medication theory to practice explaining this important relationship as, 'I don't think it matters what you teach at university, it's not embedded until they actually get out there'. Preceptors were valued role models for their capacity to

influence knowledge, skills and attitude positively. The participants described striving to practice safely and in ways reflecting their nursing education and professional standards although not as ritual nor without reason.

3.2. The team

These participants explained how they facilitated MA teamwork in practice by managing individual and organisational processes. N5 described this coordination role as 'squishy':

> Nurses are the squishy bit between the patient and the doctor. We're dealing with people, diseases and processes…and we keep it all together.

Effective communication in teamwork was described as pivotal to MA safety. 'Good teamwork' was described as including 'honest', 'clear', 'effective collaboration', 'cooperation' and 'comprehensive consultation'. MA was described as most effective when the healthcare team trusted each other's knowledge and skill. But, N10 explained that trust is not automatic in work-based relationships; rather, 'it is earned and it takes time'. Additionally, N9 and N11 said regular feedback between the team and a shared understanding of patient management helped to consolidate relationships and direct actions. Related to delegation N11 spoke of careful and frequent review of the medication orders as a strategy to address accountability. N13 reinforced:

> …even when we delegate tasks, it's about the registered nurse being responsible for the care of the patient. You do have to make sure that you've got a handle on them all [the medications] because you're ultimately responsible.

Teamwork with doctors was mostly associated with medication problem-solving. N16 prioritised a blood transfusion by gathering equipment to assist the doctor to commence the task of establishing IV access. N16 said:

> I made sure the blood transfusion was sorted because that was the reason why the patient was admitted to the ward, but it took so long to get started. It kept getting put off and put off. I wanted it to be started, and going on my shift before I left.

Collectively, the participants said that nurses detect, manage and prevent many more medication errors than are reported. N16 shared the sentiment of most of the participants in saying 'you'd be surprised at how many errors we find'. N20 described resolving multiple errors on the medication chart of a patient who transferred from another hospital:

> This lady came in with four medication sheets. Some of them were doubled-up. A morning tablet had been written up for the morning, and then on another page, it's been written up as an evening one. We were trying to sort through this big lot of medication in the drawer. They'd written her up for QID [four times a day] Endone. It was supposed to be PRN [as required]. The alarm bells just start going off.

N20 provided the prescribing doctor with the patient's previous discharge list but recalled, 'This incident was so complex that resolving it wasn't possible until more senior medical staff were available'.

Teamwork with patients was essential during MA. The participants were unanimous in their beliefs that having informed patients was crucial for patient safety. N9 described showing the medication chart to the patients as the focus of an informative conversation saying, 'honesty is the best policy. It's their right to know what's going on'. N5 reiterated this respect for patient rights as: 'It is really important that they understand what is going into their own body'. N11 and N20 also discussed how informed patients were a vital source of information about whether medications were appropriate and already given. Similarly, Participants frequently mentioned interventions to advocate for

patients. For example, N13 intervened in doctor's ward rounds:

> Unfortunately, the doctors come in packs! They [the doctors] get there, and they [the patient] can't be heard, and most of them are elderly. They're deaf, and they only need a little bit of dementia happening and they ain't got a clue. You can see their faces and they're looking around at who do I listen to 'cos there's like five of them [doctors] in the ward.

The participant's advocacy role was necessary for the clear communication of medication information from the prescriber to the patient. They were also advocating for their colleagues by cooperating, using collaborative communication and demonstrating teamwork.

3.3. The tools

The medication chart is the primary MA communication tool. It includes prescriptions and patient details. It must be accurate and complete to enable legal and safe MA. N13 reinforced that 'when there is a medication chart written out, the practice goes smoothly, If not, you go and chase the doctor'. Seeking out prescribers to finalise or rectify prescriptions was commonly called 'chasing the doctors'. N10 said, 'It's a common thing that nurses have to find it and fix it … we spend a lot of time doing that, and it impacts on administering medications'. N13 reported that sometimes 'it would take another half an hour to find them [the doctors]'. 'Chasing' made participants (N9, N12 N14, N16, and N20) 'Frustrated'.

Likewise, access to MA resources can either facilitate or interfere with MA. For example, N8 discussed having to request other nurses to surrender their medication drawer keys because 'no keys were available'. N1 added, 'lack of medications' was obstructive to practice. Sometimes participants' efforts to be timely were sabotaged by the lack of available medications. N12 said 'when you're going to the drawer, and you presume that the medications are in the drawer. But they are not. It takes time to source them'.

Furthermore, the extra steps required to fulfil MA of controlled medications placed time pressure on the participants. For example, right time MA was not always possible, at eight o'clock in the morning and evening when analgesia and sedation are usually scheduled and access to the Dangerous Drug (DD) cupboard was in highest demand. Polypharmacy created additional MA complexities. N14 talked about patients who arrive at the hospital 'with two shopping bags full of drugs' or ones who 'used an overnight bag to carry their pills'.

To help with timeliness, N11, N13, N14, N16 and N19 all used highlighter pens to indicate essential areas of the medication chart. N16 summed up this strategy of colour coded reminders as:

> I use pens with four colours on my handover sheet. I write my IV's in green and the DD's in red. Everything's colour coded. I use a highlighter pen for anything that is out of the ordinary, like the IV AB's [antibiotics] or the DD's, which take a little bit of time. It's just a reminder when you open it [the chart] you can see straight away how many [medications] I've got to do, to prioritise.

Additionally, N19 used a pen to circle the expiry dates on the foil blister packs and explained:

> The imprinted expiry dates of the medications are extremely hard to read because they are pressed in silver and often have light coloured writing on them. Circling the dates makes it stand out so we can read it.

Furthermore, quiet space to prepare and problem-solve medication issues was elusive. Space in the nurses' station and medication room was limited and noisy when lots of people occupied the area. N13 named it 'Piccadilly Circus', saying that 'It's a very chaotic and noisy environment'. N18 complained of not being able to 'think clearly' during medication preparation in the 'chaos and mayhem'.

Limited computer access was another issue for the ward-based

participants. N8 sums this up as: '… say if you're on the floor you don't have access to look at what's their [the patient's] potassium? What's their sodium?' When N11 could not gain access to a computer, the patient became the medical history information source. N11 says: 'I always look at their patient history…when I admit a patient, I'll say, "I've noticed in your chart that the doctor has written you up for this-this and this". From there the patient will expand and give you their life history'. This history gathering strategy is beyond the scope of the 5-rights and is related to the previously mentioned 'bigger picture', teamwork and patient advocacy.

3.4. The time

The time of day was a factor affecting most aspects of MA. Time pressures resulted in adjustments to practice. N15 explained that:

> In the morning, you're thinking about what lays ahead of you. I won't go like a machine over medications but if its busy I'm probably more focused on meds. Other things may have to be missed out. Personal hygiene is not omitted, but actions are altered to accommodate workload.

At times, the participant workload was more than the agreed allocation. For example, N10 explained 'the system does not reflect the extra load on the RN when teamed with others who are not allowed to administer some medications'. Time was precious to all participants who prioritised MA over other tasks. Additionally, the number of prescribed medications, their complexity and availability added to the workload and contributed to the sense of being 'busy'.

3.5. Summary of findings

By and large, these interviews provided insight into the participant experiences intended to facilitate safe MA. All the participants were aware of their responsibility and accountability for patient safety and well-being. Woven throughout the stories were some of the difficulties that participants experienced in fulfilling their objective. They talked about the positive strategies such as teamwork that they implemented to meet the challenges; this included communication and negotiation skills that were used to advocate for and facilitate effective MA. Furthermore, featuring in the participant stories were the creative actions taken to advocate for patients and to organise themselves and others. While not always aligned with the rights framework, participants used these strategies to manage the MA factors that they could influence. Factors outside their influence included access to resources and challenging contexts. The actions of the participants coupled with their clinical reasoning, went beyond the scope of the 5-rights framework to demonstrate a commitment to achieving positive outcomes for the patients. Fig. 1 incorporates the themes that emerged from these
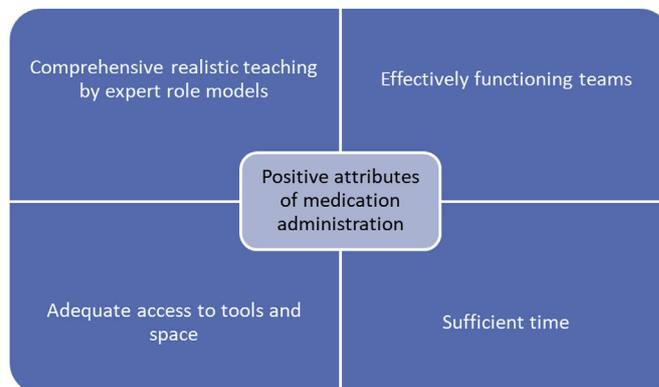

Fig. 1. The positive attributes of medication administration.
Source: Developed by Author 1 as part of phase two of a doctorate study, 2015.

findings and epitomises safe MA as described by these participants.

3.6. Discussion

This study of MA by RNs adds a nursing discipline perspective (Thorne, 2014) underpinned by a strengths-based approach (Trajkovski et al., 2013). These findings provide an alternative view to understanding nursing strategies for safe, person-centred MA. These participants demonstrated clinical reasoning to complete MA safely and as suggested by the nursing literature, included assessing relevant information, situational awareness, problem-solving and rationale decision-making (Levett-Jones, 2013).

Contrary to others this study was not a measurement of RN practice related to the steps of the rights framework (Kim and Bates, 2013). Instead, these findings add to the knowledge that MA practice goes beyond the 5-rights framework (Pauly-O'Neill, 2009) to 'get it right for the patient.' Even though the rights framework featured in the re-collections of these participants, it was apparently not used in isolation. Beyond the linear procedure, the participants applied clinical reasoning to their practice to efficiently respond to patient needs. The insight generated from this study counter-balances findings from more error-focused, traditional approaches and may inform the development of more contemporary MA educational and practice models.

These findings strongly suggest that nurses use multiple sources of knowledge and sophisticated clinical reasoning to develop strategies to deliver person-centred MA. Adding to the literature about nurses as the advocates for patients, these participants consistently, saw the 'bigger picture' of MA by, assessing and monitoring patients and interpreting and integrating the information to inform their clinical decision-making (Jennings et al., 2011; Advinha et al., 2014). The thinking and reasoning processes described in this study demonstrated competence needed in complex working environments (Levett-Jones, 2013; McKenna and Gigi Lim, 2014). These participants understood their role in the MA team and communicated effectively to advocate for patients and became a conduit for medication-related information for doctors (Jennings et al., 2011). Research that focuses on this practice does not feature in health literature about MA. These findings contribute to the ideas about competency models needing to integrate and cross the boundaries of constructivist pedagogies to 'future proof' nurses for evolving practice (Weeks et al., 2017). These discipline findings can contribute to the evolution of nursing education and practice models (Thorne, 2014).

Consistent with other studies, these participants described interruptions and obstacles to their practice that are typical of the messy reality of healthcare settings (Drach-Zahavy et al., 2014; Cloete, 2015). However, despite known challenges (Brady et al., 2009), they delivered person-centred MA and accepted the interruptions as common factors to deal with as part of daily practice. Safe, effective and person-centred nursing practice comes from the judicious application of reasoned clinical knowledge combined with skill (Benner et al., 2008; Levett-Jones, 2013). Despite MA tasks taking up considerable amounts of time (Westbrook et al., 2011) these participants purposefully combined theory and practice to understand and respond to the patient-specific needs. Stories about frontline experiences like these are informative to the development of future best practice (Benner et al., 2008; Thorne, 2014).

Finally, the RNs in this study were knowledgeable, skilled and focused on safe MA for all patients in all contexts. It was clear that MA is involved and not as simple as suggested by the rights framework (Bourbonnais and Caswell, 2014). Despite the plethora of studies that seek to identify and solve the causes of medication errors, they remain high in today's healthcare environments (Cloete, 2015; Lapkin et al., 2016). So perhaps more AI will reveal new understandings of MA and strengthen the RNs role (Adhikari et al., 2014).
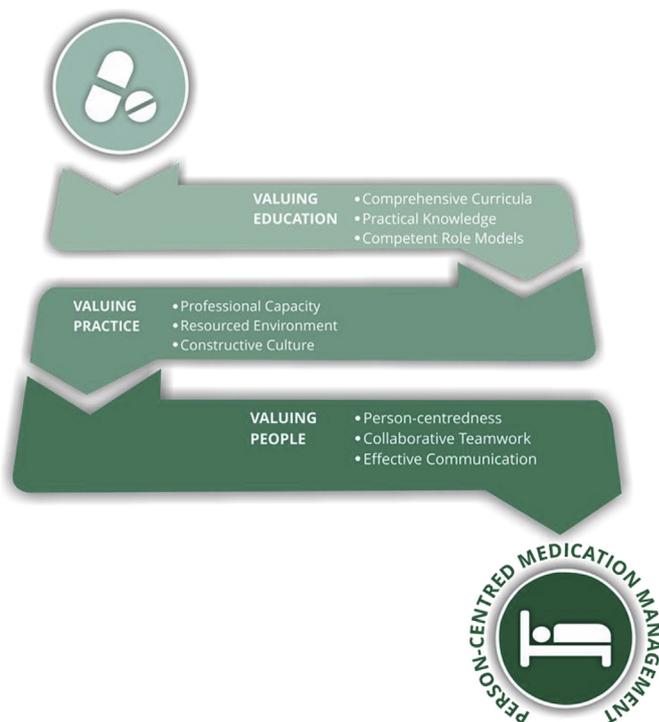

Fig. 2. Person-centred medication management.
Source: Developed by Author 1 as part of a doctorate study, 2015.

3.6.1. Implications for practice

RNs are the sentinels of MA safety, and this study contributes discipline-specific insight into safety-enhancing nursing practices. This study highlights the tacit knowledge generated in clinical contexts and the knowing in-action found in practice recommended to inform practice guidelines (Blum, 2010). Nursing curricula and assessments vary (Coben and Weeks, 2014; Cummings, 2014). But, competency models that reflect authentic clinical processes and artefacts like found in this study do enhance critical thinking (Weeks et al., 2013a,b, Martyn et al., 2014; Hewitt et al., 2015). Although standard operating procedures being recommended (Huang and Gramopadhye, 2014), reliance on the traditional 5-rights as 'the golden-rule' (McGovern, 1992) as a measure of competence is outdated (Institute for Safe Medication Practices, 2007; Pauly-O'Neill, 2009; Elliott and Liu, 2010; Lin et al., 2014). Fig. 2 highlights aspects of MA safety beyond the 5-rights framework. This problem-solving rather than problem-dwelling conceptual model is for sharing the practice strengths found in this study.

3.6.2. Study limitations

The purposeful selection of participants, was necessary because the educational foundations of healthcare professionals vary according to their discipline scope. This study was specific to RNs even though others do administer medications. Limiting the participants to RNs was a deliberate choice because RNs are accountable for the practice of others who administer medications, such as ENs. Also excluding settings such as aged care and paediatrics was deliberate because their MA tools and processes differ significantly in those settings. The decision to use settings that have standardised medication charts and the 5-rights framework enhances the applicability of these findings.

4. Conclusion

MA is a core activity of nurses working in acute care settings. Four broad themes emerged from this study to explain the participants' experiences of MA. They were teaching, teamwork, tools and time. These findings have implications for education, policy and practice; first, the

5-rights of MA framework, while helpful in principle does not reflective contemporary practice. Clinical reasoning, effective communication and teamwork were strategies used for successful MA in this study. The use of a strengths-based AI research approach was unique in studying nurses' experiences of MA and has highlighted strategies used to facilitate safe and effective practice. Finally, this study provided valuable insight into the competencies embedded in everyday nursing practice that contribute to safe and effective person-centred MA.

Acknowledgements

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nepr.2018.11.007.

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