RESEARCH ARTICLES

Peripheral intravenous catheter insertion training for undergraduate dual degree nursing and midwifery students: A descriptive qualitative study

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ABSTRACT

Background: Seventy percent of hospital admissions require a peripheral intravenous catheter (PIVC) and there is a shortage of skilled inserters. In some countries, undergraduate nursing and midwifery programs teach PIVC insertion, however, in Australia, this is typically limited to simulated PIVC insertion, without hospital-based PIVC insertion experience. We aimed to achieve nursing and midwifery undergraduate clinical competence in PIVC insertion by including hospital-based training.

Objectives: To understand 1) the experience of undergraduate nurse/midwife students who received hospital-based training to achieve PIVC insertion competency; and 2) the impact of the training on nurses/midwives' future PIVC insertion practice.

Study design and methods: Final year students completed a 5-day clinical placement with a hospital vascular access surveillance and education service. Semi-structured interviews occurred at the completion of the placement. A brief cross-sectional survey 12 months later questioned the impact of this training on their subsequent practice as registered nurses/midwives. Interviews were analysed using Braun and Clarke's six phases of inductive thematic analysis to detail participants' experiences and beliefs. Survey data was described descriptively and barriers and enablers to clinical competency were explored.

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Results: A total of 19 students participated in the clinical placement between March and September 2022 with 16 achieving clinical competency. Eleven students were interviewed. Key themes developed include: 1) clinical PIVC training for undergraduate nurse-midwives builds knowledge, skills, and confidence; 2) mixed mode clinical placement learning builds on undergraduate university training; and 3) barriers and enablers to clinical competency. At 12 months, 60% of participants were employer-certified as PIVC competent and had performed the procedure as a graduate nurse or midwife.

Conclusions: Clinical placement with hospital-based vascular access services can enable undergraduate student nurses and midwives to develop PIVC competency. The study highlights the critical role of clinical placements in better preparing nursing and midwifery students for the demands of contemporary healthcare practice.

What is already known about the topic?

- In Australia, nursing and midwifery undergraduate education commonly includes PIVC insertion, however, students do not have the opportunity to obtain competency in PIVC insertion via a hospital-based training program.
- Nurses and midwives have the opportunity to obtain their PIVC competency once registered, usually within specialty departments such as emergency, operating theatres, and birth suite.
- Internationally, nursing students commonly learn to insert PIVCs and continue to utilise this skill for the duration of their clinical placements.

What this paper adds

- This paper demonstrates that nursing and midwifery students are able to obtain PIVC competency as part of a hospital-based training program and maintain this skill after one year.

Keywords: Catheterisation, competency-based nursing education, nursing, midwifery, peripheral education, vascular access device

BACKGROUND

Healthcare organisations expect graduate nurses and midwives to be competent and "work ready", able to practice autonomously with minimal guidance. As such, clinical placements are integral to the education and development of nursing and midwifery students.[1,2] Placements provide context for theory and opportunities to practise clinical skills under the guidance of experienced practitioners.[3,4] To achieve competence, nursing and midwifery students need opportunities to practise clinical skills in real settings.

It is estimated that 70% of hospitalised adult patients require a peripheral intravenous catheter (PIVC) to receive medications and fluids, making PIVC insertion the most frequent invasive procedure in hospitals.[5,6] In Australia, the care and maintenance of these devices is shared between health professionals. Junior medical staff, following the completion of a PIVC training program, insert the majority of PIVCs in Australia,[7] while nurses and midwives are primarily responsible for day-to-day device maintenance.[8,9] However many nurses also cannulate, particularly in specialty areas (e.g. emergency department [ED], infusion centres, medical imaging departments, haemodialysis [HD] units, cancer treatment services or vascular access teams) or in areas where medical staff are not readily available (e.g. rural and remote regions).[5,7,10-13] Nurses in general medical and surgical areas generally have less opportunity to obtain PIVC competency within their specialty, despite evidence that PIVC insertions in these areas are often delayed due to inadequate numbers of inserters.[14] Due to medication administration or prophylaxis most women have a PIVC during labour and birth,[15] therefore midwives also cannulate. In contrast, in most other countries PIVC insertion is primarily a nursing or midwifery,[16,17] rather than medical, responsibility, and undergraduate education commonly includes PIVC insertion.[5] For Australia to meet national standards for PIVC management,[18] it is timely to reflect on the job-readiness of students in this area. Australian undergraduate nursing, midwifery, and medical university programs usually teach PIVC insertion and maintenance through simulation-based learning throughout the duration of the program.[1,19] Usually, the PIVC skill is taught in laboratory settings, where students practise cannulation as part of clinical simulation scenarios. During clinical placements, however, hospital-based PIVC programs primarily target third- and fourth-year medical students to prepare them for their internship year. In contrast, nursing and midwifery students are rarely offered opportunities to practise cannulation, and therefore, they require additional training once registered to achieve PIVC insertion competence, potentially delaying their work readiness.

Teaching nurse/midwife students to insert PIVCs under the direct supervision of expert cannulation competent trainers during clinical placement is likely to have a career-long benefit to these practitioners and to health services by increasing knowledge, skills and confidence with this common procedure, promoting work readiness upon graduation. Therefore, the aims of this study were to understand 1) the experience of undergraduate nurse/

midwife students who undertook clinical placement rotation with a hospital vascular access surveillance and education service with a focus on achieving PIVC insertion competency; and 2) the impact of the training on their future practice as registered nurses/midwives.

METHODS

STUDY DESIGN

A descriptive, qualitative study was conducted within the Vascular Access, Surveillance and Education (VASE) unit at a large quaternary hospital between March 2022 and September 2022 to evaluate a novel nursing/midwifery student clinical placement focussed on PIVC insertion.[19,20] This study is presented in line with the Consolidated Criteria for Reporting Qualitative health research (COREQ).[21]

SETTING

The VASE unit is a dedicated and focused team that facilitates clinical, educational and surveillance aspects of vascular access device utilisation. The unit's objective is to improve clinical outcomes by preventing bacteraemia and other morbidity associated with vascular access devices and to maintain vessel health.

SAMPLE

A purposive sample of fourth-year (final year) undergraduate dual degree (nursing and midwifery) students enrolled at the University of Queensland, were invited to participate in a clinical placement in the VASE unit.

PROCEDURE

Participants completed a structured five-day clinical placement in the VASE unit under the supervision of Clinical Nurses (CNs). The focus of the placement was to build on students' content knowledge of vascular access and gain competency in PIVC insertion.

Prior to patient interactions, participants were provided with a workbook and attended a practical skills workshop to practise PIVC insertion on mannequins to build on their university PIVC skills training.

Participants were then supervised by CNs in PIVC insertion on a variety of patients with differing vascular characteristics, including those with difficult intravenous access, young adults, and the elderly, using both visual and palpation techniques across various sites on the forearm, providing them with a spectrum of potential clinical scenarios.

A clinical skills assessment tool for PIVC insertion, previously developed by VASE for health professionals, was used to determine competence. The tool required students to perform multiple supervised insertions until they demonstrated safe, independent practice. Competence was determined by the number of successful insertions and satisfactory completion of all performance criteria outlined in the assessment. The required number of successful insertions was individually based. Consent was obtained from patients requiring a PIVC prior to insertion.

Upon completion of this clinical placement, between May 2022 and January 2023, students were invited via email from the university administration to participate in voluntary face-to-face semi-structured interviews to understand students' perceptions, experiences, and self-assessed competence in PIVC insertion. A brief 12-month follow-up cross-sectional survey was then sent to students between July 2023 and October 2023 to assess their self-reported experience, competence and professional development with PIVC insertion since commencing work as a new graduate nurse/midwife.

DATA COLLECTION

Semi-structured interviews

Eleven face-to-face semi-structured interviews were conducted between 26 May 2022 and 4 January 2023. A mix of 9 closed and open-ended questions were developed by the research team and informed by vascular access specialists, university course convenors and a quality clinical placement evaluation tool.[22] One interviewer (DB), a female registered nurse and experienced qualitative researcher with no prior relationship with the participants, conducted all the interviews. These were conducted in person at times and in locations (e.g. hospital or university setting) convenient for participants using a structured interview proforma for guidance. Only the researcher and participant were present during the interviews, which lasted an average of 12 minutes. Interviews were audio-recorded and transcribed verbatim, with answers anonymised before the analysis. Transcripts were not returned to participants for comments and clarifications. Interview questions are provided in supplementary material 1.

Twelve-month follow-up survey

An 8-question, cross-sectional survey was developed based on interview data and tested for face validity by the investigators, a small group of expert nurse and midwife researchers, and then sent to all clinical placement participants between 17 July 2023 and 29 October 2023 via Microsoft Forms™. Surveys were a mix of open and closed answer questions, distributed via email and accessible on both computer and mobile devices. Two reminders were sent each month over the course of three months to those who had been interviewed, to encourage participation. Survey questions are provided in the supplementary material.

DATA ANALYSIS

Braun and Clarke's six phases of inductive thematic analysis were used to detail the experiences and beliefs of participants.[23] Interviews were transcribed and coded line-by-line independently by two researchers (DB and GRB) to enhance dependability.[24] Codes were utilised to inform the development of concepts, themes and sub-themes identified by consensus between researchers. Themes were reviewed in relation to coded extracts, and a thematic map was generated. A selection of extract examples was provided in text to support final themes. Themes were reviewed and defined with continued reference to codes and raw data via ongoing consultation with the project team to enhance validity.[24,25]

Survey responses were tabulated into counts and percentages for quantitative responses and thematically analysed in the same method as interviews for the open-ended responses.

Interview and survey responses were then compared to achieve a full understanding of both the immediate student experience and understand the impact of this training on clinicians' future practice.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the University of Queensland (Ref 2022/HE000191) prior to the commencement of the study. All interview participants received a written participant information sheet and provided informed written consent. Voluntary completion of the online survey was considered consent to participate.

RESULTS

INTERVIEWS

A total of 19 nurse/midwife students participated in the 5-day clinical placement with the VASE service between 28 March 2022 and 16 September 2022. All students identified as female, aged between 20 and 30 years. Twelve students (63%) agreed to participate in a follow-up semi-structured interview, however, one could not find time to participate due to clinical requirements and seven (37%) did not respond to the email invitation.

Of the responses from the 11 students who participated in interviews, three key themes were identified:

1. Clinical PIVC training for undergraduate nurse-midwives builds knowledge, skills and confidence.

Participants spoke of how beneficial they found their clinical placement with the VASE service. Participants particularly enjoyed the opportunity to master an important skill in a safe learning environment not usually offered to them as undergraduates.

> "I enjoyed learning how to do it [cannulation] properly … I think overall it was a good experience to learn how to do that, because it's a really great skill to have as a midwife, and it's like every woman needs one if they're having a fluid intervention in their labour and delivery, and it's just something you should do rather than getting a doctor to do it, especially because sometimes the doctor isn't around. I really enjoyed learning it and I look forward to using the skill." (Interview 6)

> "Overall, the experience was a very positive one with both the staff and patients and learning the skill. I found the skill very valuable in the clinical setting, and I thought it helped alleviate some of the stress in the emergency department as well as in nuclear medicine in helping them to cannulate." (Interview 7)

Participants added that learning the 'how' and 'why' behind PIVC insertion and maintenance practices, in line with current policy, helped them to recognise the importance of using evidence-based practice for patients with a PIVC in their care.

> "In my placement I learned all the evidence behind the skill and evidence-based practice with really highly trained, skilled clinicians … We were taught why and then how as well and I think doing five days in a row really solidified those skills and the theory behind it, so it was a really good learning model." (Interview 1)

> "Definitely it enhanced my knowledge all about cannulation, not even just the insertion process, but the different types and the things you need to be aware of once they're inserted, how long they (the PIVCs) can last, the different types of areas and veins, my knowledge expanded a lot. It was honestly just because they were taking the time to explain and show me, we weren't in a rush, I could ask as many questions as I could, so they were really supportive, so yeah it enhanced my knowledge a lot." (Interview 5)

Participants appreciated the opportunity to gain confidence in PIVC insertion with VASE in a simulation environment prior to patient interaction and received one-on-one education, supervision and feedback when developing their PIVC insertion skills. Participants were asked to rate their level of confidence in PIVC insertion based on the amount of PIVCs they had inserted, successful attempts and knowledge of policies and procedures. Confidence levels were rated from 1–10 (10 being most confident). The predominant modifier for their confidence score was a desire to practise more, both during and post placement.

> "Overall, if I'm going to be honest, I would say a 6. I only … I'm certified now, but I still don't feel 100% confident in cannulating and that's just because I had limited experience to do it due to the high demand of hard patients they needed to cannulate where I couldn't, even though I tried I wasn't successful, so my confidence was not there, because I haven't had many successful attempts." (Interview 5)

> "I feel like it would be a very strong 7 … I think I feel very confident going forward, but I feel like I would want one or more (because of the gap of doing it) sessions with someone just to brush over it and make sure I'm doing the right thing, otherwise performing the skill I feel very confident." (Interview 7)

2. Mixed mode clinical placement learning builds on undergraduate university training.

Mixed mode, informative and detailed teaching was a common theme identified.

> "I think it was really good,… we only had a three-hour session with our university learning, just on dummies, and then we hadn't been able to do it on actual people, so starting with the VASE team, we started from the very start, like the basics, all over again, and then went from basics to cannulating people, so it was really good starting from yeah the basics." (Interview 2)

> "So, during my experience, I had my first day doing a workshop with the nursing staff where there was theory and practice on the models, and then from the second day onwards I was practising on patients. There was a combination of ultrasound guided cannulations and just regular hand cannulations, and it was overall a really good experience." (Interview 4)

> "I think it greatly progressed my knowledge, 10/10 learning and teaching, as I said the teaching that I got at uni was like, here's the dummy and this is how you do it, and that's it, you do it maybe once or twice. Then learning it from the CN on the dummy first and then going and doing it directly after in a human arm, like a live arm, was yeah much more helpful. And the more you do it the better you become, and we got to do quite a few that week. Because veins are all different, not all different, but some people have different structure of their veins, so it was good to do a lot of looking for veins and making sure that I was putting it in the right place and getting confirmation from the nurse. And then doing it, rather than just 'oh you can see where the vein on the dummy arm is because everyone's been there.'" (Interview 6)

Participants valued spending time with clinicians who specialised in vascular access insertion, management, and surveillance, as they believed they were able to build on the knowledge they had learnt at university and practise those skills in a safe, supervised, clinical environment.

> "So previously I hadn't had any actual real experience in cannulation, I had just done it on a mannequin at a random 2-hour workshop, at a random point in the year and hadn't had the opportunity to complete the skill on a real person. So, it was extremely beneficial to have that one-on-one experience and education with the VASE team members and going around and completing cannulation on patients in the hospital. It was also good working with staff who were very specialised in that area as well because they had lots of knowledge and education that they could provide to us in regard to completing calculations and also the care of cannulas." (Interview 10)

Participants discussed that this combination of university and hospital teaching supported their skill development and improved their confidence with PIVC insertion and maintenance.

> "I would say it definitely built upon the foundation of what we got in the course, I would say it was very basic in the course and very briefly covered, the skill was quite brushed over. I think that going into the VASE team and having to do the pamphlet and the booklet it just opened up everything, like the education on infection control was much more in depth, which I think was more beneficial to our practice. And also having one on one time with the supervisors. When you're learning in uni with classes with 8 people with one tutor for 2 hours, whereas this was five sessions one-on-one most of the time, which was really good to build upon the small foundation we had, so I feel like I'm much better prepared now then I was." (Interview 7)

One respondent stated that the placement with the VASE service also helped in learning how to provide education to patients and other staff members, as well as alleviate some of the workload for staff.

> "The most helpful aspects were being able to take over from other staff who were stressed with having to fulfil other tasks, I think we saved them a lot of time being able to do that for them. I think it was good for even the patients being able to see students in the learning environment, and they also got education while we got education, because when you're doing the skill the supervisor would explain it to us and educate us, and I think that the patients also picked up on that which made them feel more comfortable with why they were getting it. And I think it was also helpful with teaching some of the staff, because I know when I was in the emergency department some of the staff had questions directed to the VASE team, so they could ask questions in real time and that was really helpful for their training and education as well." (Interview 7)

3. Barriers and enablers to clinical competency.

Inserting PIVCs under the direct supervision of a qualified PIVC trainer outside of VASE is a condition for all students (medical, nursing and midwifery) who successfully obtain their PIVC competency. However, several students/participants reported that it was difficult to find opportunities to cannulate once they finished the clinical rotation with the VASE team, due to staff being too busy or a lack of available qualified PIVC trainers to supervise them.

> "The challenge is just about getting the opportunity to do the actual practice on people and on patients, and also finding people that are confident enough to guide me, especially when I was finished with the PIVC group, you have to actually go and find someone who is confident and giving you the opportunity to do it is really hard." (Interview 3)

> "I think … a limitation was [there] weren't a lot of trainers, there weren't a lot of opportunities for me to cannulate in the birth suite which was frustrating because I wanted to use the skills that I had and I wanted to make sure that I was keeping it up and doing it correctly, because the more cannulations you do the better you become, then if I don't do it a lot I won't become better." (Interview 6)

> "The main [challenge] for me was just that it was really late … in my whole placement block, so I did it and then I finished my placement a week later, so I didn't have much of an opportunity to carry on the skill as a student, especially considering I went to a different clinical area afterwards where cannulation was impossible for me as a student … Also, during the five shifts there was a lot of downtime as the VASE staff needed to complete their own research or their other tasks that they were doing or they had other obligations such as CVAD workshops and stuff which I was still able to attend but obviously wasn't as relevant to completing cannulation." (Interview 10)

Participants recommended the clinical placement with the VASE service would benefit all undergraduate nursing and midwifery students, rather than dual degree students only.

> "I would say everyone should do it when they are a student, and everyone should learn (cannulation), especially not only the dual degree but also like nursing (straight nursing and straight midwifery)" (Interview 3)

> "Where possible, expand the training to nursing students as well because in my perspective nursing students would actually probably have more opportunities to complete cannulation on wards or in their clinical areas compared to midwifery." (Interview 10)

A common recommendation was to move the clinical rotation earlier in their undergraduate studies. Two reasons were offered for this: 1. To avoid the stress of having to complete the rotation at a time when they were trying to complete their clinical requirements (specifically achieving primary attendance at 30 spontaneous vaginal births); and 2. To give them more time to practise PIVC insertion before graduating.

> "I think it will be better to do it when you're second year, … already know some knowledge, so you get two more years to practise…." (Interview 3)

> "If I'd been able to complete the cannulation insertion shifts earlier in my degree that would have been helpful, I would have been able to practise the skill a lot more and continued to build confidence and competency around the skill." (Interview 10)

> "I think what I would have absolutely loved … would be to have done the VASE experience one semester earlier. So, like at the end of third year just would have been so good because you were learning about cannulation in clinicals. And also, because of midwifery, everyone was so stressed about getting the birth numbers that you need to graduate. So, it was hard and it was a bit stressful for some people who didn't have the numbers … doing it a semester earlier would be so nice cause you could kind of just focus on it." (Interview 11)

TWELVE-MONTH FOLLOW-UP SURVEY

Nineteen 12-month follow-up surveys were distributed to all who participated in the 5-day placement with VASE in 2022. This survey saw a 52.6% (11 respondents) participation rate, similar to that of the interviews 12 months prior, with 90% of respondents having a positive experience in PIVC insertion since graduating. Of those who had obtained their PIVC competency and had cannulated since commencing work as a new graduate nurse or midwife (60%), 100% reported that the skills they had developed with VASE had progressed their skills and knowledge with PIVC insertion across a range of departments (ED, ward, birth suite, rural).

> "The training gave me a good foundation of the skills and has given me more autonomy in my practice as a nurse/midwife in the rural health service where I am currently working." (Response 8)

> "The clinical skills training received with VASE was fantastic. Having a workshop to refresh prior skills was also great and has allowed me to be more confident in the workplace." (Response 2)

Of those who had their undergraduate competency recognised by their graduate employer and who had completed a refresher workshop at a health service, over one-third (36%) of respondents stated that they had no challenges in maintaining their PIVC competency since commencing work as a new graduate nurse or midwife.

> "No. I easily was able to obtain PIVC competency within ED department." (Response 7)

However, 27% reported that there were limited opportunities to cannulate in their graduate work environment, with patients often cannulated in the Emergency Department or birth suite prior to admission to their ward. Additional challenges noted were a lack of PIVC competent assessors to assess new graduates (18%), as well as managers unaware that new graduates could now acquire their PIVC competency during their undergraduate degree (9%).

Of those who had cannulated since commencing work as a new graduate nurse or midwife (60%), when asked how many PIVCs they had inserted to date, respondents had inserted between 3 and 50 cannulations with an 80–100% success rate. Eight of 11 survey respondents insisted that seizing every opportunity to practise PIVC insertion was the key to gaining confidence and skill.

> "It is a great skill, so try to take any opportunity to practice. Like any new skill, initially, PIVC insertion really scared me but since inserting more I have gained confidence and am no longer nervous to cannulate." (Response 6)

When asked if participants had any recommendations that they believed would improve the program in future, 45% of respondents stated that completing VASE placement earlier in their degree would allow students to further develop their PIVC insertion skills on their remaining clinical placements. 20% stated that a refresher course with VASE would be beneficial to help students maintain and further develop their skills post placement. And 18% stated that having more PIVC trainers on the ward to supervise students once competent would provide students with more opportunities to practice their PIVC insertion skills.

DISCUSSION

This study has identified the benefits of PIVC insertion training and competence attainment for undergraduate dual degree nurse/midwife students through a clinical practice placement within a specialised vascular access hospital service. Clinical placements play an essential role in undergraduate nursing and midwifery degrees by providing hands-on, real-world experiences in a diverse range of health settings, thereby fostering the application of theoretical knowledge into the clinical environment.[26] Internationally, undergraduate nursing and midwifery students do have access to hospital-based PIVC training programs, and this is a mandatory component of their university curricula.[27,28] However, in Australia, medical students and nursing/midwifery students have access to simulation-based PIVC insertion training programs,[29] yet often do not receive this real-world training, meaning that it takes longer for them to become work ready following graduation.

This project highlights the importance of structured and comprehensive training programs in preparing students for clinical practice. Participants in this study perceived their 5-day placement with VASE as both enjoyable and beneficial, as they were able to gain competence in a skill not usually offered to them through a specialised hospital service. This positive response speaks to the effectiveness of providing students with a safe learning environment where they can master essential skills under the guidance of experienced practitioners. Offering one-on-one education, supervision, and feedback enables students to acquire technical skills and to understand the underlying evidence governing PIVC insertion and management. Research with undergraduate nursing students has identified that inconsistencies between content taught in the university and individual clinicians in the workplace can impede students' learning.[19] Registered nurses may not be up-to-date with evidence-based practice for PIVC insertion and management, and conflicting practices among different clinicians and work areas can lead to confusion for students,[19,30] however, we did not find any evidence of this disconnect in our results.

A key outcome of the study was the enhancement of participants' confidence in PIVC insertion following their clinical placement. By providing students with simulation-based learning opportunities and personalised education and feedback, the program empowered students to develop their skills with proficiency and assurance. An emphasis on understanding the rationale behind PIVC practices instilled in the students a deeper appreciation for evidence-based care, reinforcing the importance of adhering to established protocols and guidelines in PIVC management. Additionally, placements hosted by the VASE service provided students with time to consolidate learning and solidify their skills, paving the way for a smoother transition into professional practice upon graduation. Research confirms that such training experiences are instrumental in building students' confidence and competence in performing clinical procedures, ultimately contributing to their readiness for professional practice.[2,4,19,30,31]

Participants in this study described how the skills learnt during their 5-day placement with VASE contributed to their experience with PIVC inserting into their graduate year. Since commencing work as a graduate nurse/midwife, participants described they had received recognition of prior PIVC insertion competency as an undergraduate nurse/midwife, and increased insertion confidence particularly in high acuity areas and emergency situations requiring immediate cannulation, as well as rural and remote health services with limited resourcing. This has obvious benefit for health services if graduates arrive competent or are easily brought to competence once employed. Given the high volume of PIVC insertions in Australian hospitals each year, a competent, available workforce is crucial, and the current model reliant on junior doctors has been shown to be inadequate.[7,32]

This work emphasises the value of multi-method training, using adult learning strategies to enhance students' learning experiences. Several studies have shown that undergraduate university programs alone do not adequately prepare nursing students to undertake essential skills such as PIVC insertion and management in the clinical environment.[19,27,33] Learning PIVC insertion needs to incorporate practice with real patients to be of practical use for students.[34] By building on the university PIVC training and combining pretraining activities, such as workbooks and practical workshops, with hands-on clinical experiences in the hospital environment,

students are equipped with a robust understanding of PIVC insertion and maintenance practices. The opportunity to interact with specialised clinicians in vascular access further enriches students' knowledge and skill development, enabling them to apply evidence-based principles in real-world healthcare scenarios. Additionally, the collaborative nature of the teaching approach not only benefits students but also extends to patients and other healthcare staff, fostering a culture of continuous learning and knowledge exchange within clinical settings. With thousands of nursing and midwifery students in Australia graduating each year,[35] hospital vascular access service capacity to train larger numbers of nursing and midwifery students requires further investment.

While this study demonstrates the efficacy of undergraduate clinical placements in preparing students for PIVC competency, it also sheds light on the challenges faced by new graduates in maintaining their skills post-graduation. Limited opportunities for cannulation in non-acute work environments, coupled with a lack of PIVC competent assessors and managerial awareness, pose significant obstacles to new graduate nurses.[27] To address these challenges, stakeholders must explore avenues for ongoing skills development and support, such as refresher and mentorship programs.[29] Hospital-based vascular access teams must be adequately resourced not only to undertake initial training, but also ongoing mentoring and refresher training for nursing and medical staff. By investing in initiatives that facilitate continuous learning and professional growth, healthcare organisations can empower new graduates to navigate the complexities of clinical practice with confidence and competence.

Extending this program to second and third-year students could be beneficial in enabling students to practise their cannulation skills under extended supervision, to improve confidence and competence in preparation for their graduate year. Integrating hospital-based placement cannulation rotations into nursing and midwifery curricula could alleviate junior medical practitioner workload, while enabling students to feel more prepared and "work ready", particularly in clinical areas requiring nurses/midwives to cannulate as part of routine patient/woman care (ED, infusion centres, medical imaging departments, HD units, cancer treatment services and birthing units).

LIMITATIONS

This paper describes the experience of one hospital clinical placement program for PIVC training for dual degree nurse/midwife undergraduates, and therefore the findings cannot be generalised to other sites without a dedicated vascular access support service.

CONCLUSION

Hospital-based vascular access services can provide undergraduate nurse/midwife students with one-on-one learning opportunities to develop and obtain their cannulation competency. Australia could benefit from ensuring undergraduate clinical placement opportunities occur with vascular access specialist nurses. The study highlights the critical role of clinical placements in preparing nursing and midwifery students for the demands of contemporary healthcare practice.

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