RESEARCH ARTICLES

Benefits and impacts of the PNSA role: surgeon and nurse perspectives

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ABSTRACT

Objective: To develop an understanding of the knowledge, skills and qualities the Perioperative Nurse Surgeon's Assistant (PNSA) role contributes to surgical service delivery in Australia.

Background: The benefits and attributes of the PNSA or Non-Medical Surgical Assistant (NMSA) have been explored globally. Previous research demonstrates the PNSA or NMSA as effective providers of safe and effective delivery of surgical assisting care. The PNSA as an advanced practice nurse (APN) has been identified as improving both the quality and accessibility of surgical care, although this is yet to be fully acknowledged in the Australian context. Greater exploration of the benefits and contributions of the PNSA to surgical service delivery in Australia is required.

Study design and methods: A mixed method design study was undertaken across four healthcare facilities in South Australia; including a quantitative, cross-sectional survey of perioperative nurses, as well as semi-structured, qualitative interviews with surgeons who work with a PNSA.

Results: From a survey of 55 perioperative nurses and five surgeons who work with PNSAs, the seven attributes or qualities deemed to be important of the PNSA included knowledge of anatomy, instrumentation and surgical procedure, consistency, theatre efficiency, collaboration, educational resource, patient advocacy and leadership.

Discussion: The identified benefits and attributes of the PNSA clearly demonstrate the advanced level of perioperative expertise they bring to the surgical team, but also that they have the ability to change the culture of the team, embracing a more unified working environment. Consistency of practice and collegiality between medical, PNSA and nursing teams can offer advanced perioperative care to the surgical patient. Surgical assisting knowledge and skills often require a protracted learning curve to attain expertise, a role suitable to be undertaken by PNSAs practicing in APN roles. Where consistency of a qualified medical assistant is not routinely available the consistency and dependability of the PNSA is particularly suited to highly technical specialist surgical domains and sought after by the surgeons interviewed.

Conclusion: The PNSA can positively affect the operating theatre environment and offer multiple individual benefits to the patient's surgical journey. The consistency the PNSA conveys offers a more streamlined process for the operative team, reassurance for the surgeon and the potential for improved theatre efficiency. This consistency is seen to enhance communication across the surgical team increasing patient safety, increasing efficiencies in both the individual patients' surgical journey and across the surgical service.

Implications for research, policy, and practice: The PNSA is a valued member of the Perioperative team from both medical and nursing perspectives, who contributes qualities of specialist knowledge, a positive and collaborative team culture and continuity attributes to the operative team and environment. The healthcare benefits and impacts from these positive qualities needs to be explored further.

What is already known about the topic?

- Previous research demonstrates the PNSA or NMSA as effective providers of safe and effective delivery of surgical assisting care.
- The PNSA has been identified as improving both the quality and accessibility of surgical care in Australia and globally.
- There is limited evidence identifying the qualities the Perioperative Nurse Surgeon's Assistant (PNSA) role contributes to surgical care in Australia, compared to international settings.

What this paper adds

- The knowledge, skills and qualities of the PNSA provide a nexus within the operating team, with the surgeons they assist and to develop a positive culture with the surgical environment.
- The role of the PNSA is highly valued from both medical and nursing specialties.

Keywords: Perioperative Nurse Surgeon's Assistant, Non-Medical Surgical Assistant, Advanced Practice Nurse, nurse, Registered Nurse First Assistant.

OBJECTIVE

To develop an understanding of the knowledge, skills and qualities the Perioperative Nurse Surgeon's Assistant (PNSA) role contributes to surgical service delivery in Australia.

BACKGROUND

The benefits and attributes of the Non-Medical Surgical Assistant (NMSA) have been documented globally.[1-12] Some NMSA groups have been successful in gaining professional recognition and regulation within their various healthcare systems around the world, although evidence suggests the roles and benefits of NMSA's differ globally based on locality and between healthcare systems.[1] Within Australia, the role of NMSA or Perioperative Nurse Surgeon's Assistant (PNSA) has limited documented evidence on what these benefits are, with the PNSA role continuing to encounter barriers to gain professional recognition and regulation.[13,14,15]

The PNSA or NMSA is an emerging role in Australia undertaken by highly experienced perioperative nurses since the 1990's.[16] For this study the term Perioperative Nurse Surgeon's Assistants (PNSAs) will be used and includes Non-Medical Surgical Assistants (NMSAs) and Registered Nurse First Assistants (RNFAs), and a perioperative nurse is a nurse who works in the operating theatre. The PNSA practices as the first assistant in surgery under the guidance of the surgeon. The role is not currently recognised or regulated by a professional body in Australia, despite the role meeting the definition of the scope and practice of an Advanced Practice Nursing (APN) role in Australia.[2] The Nursing and Midwifery Board of Australia (NMBA) states "Advanced Nursing Practice as a continuum along which nurses develop their professional knowledge, clinical reasoning and judgements, skills and behaviours at higher levels of capability (that is recognisable).Their practice is effective and safe".[17]

The one Advanced Practice Nursing (APN) role that has been successful with professional recognition and regulation in Australia is the Nurse Practitioner (NP), which has demonstrated nurses can build on their current knowledge and skills and become more independent practitioners.[13,18,19] The Nursing and Midwifery Board of Australia (NMBA) limit use of the term APN to the NP role. The NMBA acknowledge there are many other specialty groups and areas within nursing but do not recognise them as APN roles. Research conducted by the NMBA has explored the need for regulation of these specialty areas and concluded that organisations that represent such areas have developed their own processes of recognition and are sufficient for employers and the health industry to recognise their practice.[20,21] In Australia, the NP builds and expands upon the standards of practice of those required of an RN, building on their responsibilities and accountabilities within their specialist area of care and enabling them to work independently and collaboratively across the multi-professional environments.[22]

The PNSA role has been shown to benefit patients and communities, by expanding access to surgical services, particularly in rural areas, where inconsistency of medical assistants and medical practitioners is limited and unreliable.[15,23] However, the expansion and broader utilisation of PNSA roles in Australia continues to encounter barriers without support from the NMBA. Limitations relate to health service utilisation of PNSAs and access to funding schemes (such as Medical Benefit Scheme).[24] The Australian College of Perioperative Nurses (ACORN) recognise the role of PNSA as a legitimate perioperative position that warrants its own professional standard.[25]

The Australian Association of Nurse Surgical Assistants (AANSA) was established in 2012, to support the ongoing development of the PNSA role in Australia and represent both practicing and student PNSA's. Presently, there is one

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tertiary organisation (Latrobe University) in Australia which provides education to perioperative nurses to meet the PNSA credentialing requirements outlined by AANSA, which requires PNSAs have at least five years perioperative nursing experience, registration with Australian Health Practitioner Regulation Agency (AHPRA) and meet clinical assisting competency hours with a surgeon mentor.[16, 23]

Studies into the role of the PNSA have identified multiple patient-centred benefits throughout the phases of perioperative care; preoperative, intraoperative and postoperative.[2,4,5,7,8,13,18,26,27] Such benefits relate to the areas of leadership, educational resource, patient education, operating theatre efficiency, reduction of surgical site infection, patient advocacy, knowledge of anatomy, instrumentation, equipment and surgical procedures, and collaboration between professional, medical and allied health groups.[2,4,5,7,8,13,18,26,27] Consistency within the role of the PNSA was identified as an attribute within the role supporting increased efficiencies leading to improved operating room patient throughput and improved patient outcomes and safety.[28] The PNSA is also perceived to be linked to equity of access to surgery within both the private and public health systems.[29]

To further encourage professional recognition of the PNSA role in Australia, it is important to broaden the evidence-base affirming the benefits and contributions of the PNSA role to patient care, the perioperative team and the healthcare setting. This study explores the knowledge, skills and qualities the PNSA role contributes to surgical service delivery in Australia, from the perspective of perioperative nurses and surgeons who work with PNSAs in South Australia.

METHOD

A mixed method design study was undertaken across four private healthcare facilities in South Australia: including a quantitative, cross-sectional survey of perioperative nurses, as well as a series of semi-structured, qualitative interviews with surgeons working with a PNSA.

A literature review was conducted to scope recent publications relating to the benefits, qualities, and attributes the PNSA contributes to healthcare delivery. A search of databases CINAHL, Proquest and Google Scholar was conducted. Inclusion criteria were peer-reviewed articles published in English between 2016-2022. Examples of terms searched for include role, perception, surgical, surgeon, nursing non-medical, assistant, which produced the review of 37 articles in total.

The literature review identified evidence-based qualities and attributes associated with the PNSA in Australia, listed here from greatest number of citation to least; Collaboration between professional, medical and allied health groups (5), Reduction of Surgical Site Infection (SSI) (5), Leadership (4), Educational Resource (4), Knowledge of Anatomy, Instrumentation, Equipment & Procedures (4), Continuity of Care (4), Cost Effectiveness (4), Patient Education (3), Theatre Efficiency (3) and Patient Advocacy (2).

Based on the qualities that emerged from the literature review, survey questions were developed for both the perioperative nurse survey and the surgeon interviews. The perioperative nurses were provided a four week period in which the online survey could be completed, and the surgeon interviews were conducted during this same four week timeframe. Quantitative and qualitative results were triangulated to identify which of these benefits were applicable to the PNSA in South Australia. The scoping review was undertaken as part of a Master's level study, and ethics approval (low risk) was granted from Latrobe University at each of the four participating hospitals; nil ethical issues arose during this research project. The survey questions were piloted on six perioperative nursing staff at one of the hospitals for validity; these six staff regularly work with a PNSA, are perioperative nurses and expressed previous interest in the theme of the study.

STUDY POPULATION AND SAMPLING

Participation was sought from perioperative nurses and surgeons from four private hospitals across South Australia, which were identified to use and employ PNSAs. Inclusion criteria stipulated participants must work with or have worked previously with a PNSA. The total population of this group across the four hospitals was calculated to be approximately 72 perioperative nurses. Utilising the Australian Bureau of Statistics (ABS) sample size calculator, it was determined to achieve statistical significance with a 95% confidence interval and a 5% margin of error, a sample of 60 perioperative nurses from this population would need to complete the survey. While this was achieved, some were deemed invalid due to the participants not meeting inclusion criteria of having worked with a PSNA; 55 valid survey responses were returned.

Semi-structured interviews were undertaken with five surgeons who routinely work with PNSAs or have previously worked with a PSNA. The inclusion criteria for the surgeon group stipulated participants must utilise or have in the past utilised PNSA's as their first assistant in surgery. The population size of the surgeon group that utilise PNSA's in South Australia was approximately 15; only five surgeons expressed interest to be interviewed.

DATA COLLECTION

Data collection was undertaken over a fourweek period in September 2020 for both the perioperative nursing and surgeon groups.

A mixture of sampling methods was used to recruit participants. Convenience sampling was utilised via online access to the survey for the perioperative nurse group. An advertising poster was circulated by Perioperative Nurse Educators at the four identified hospitals in South Australia via email, education notice boards and discussed with staff. Perioperative Nurse Educator's contact information was requested by the author by phoning the Perioperative Department. One follow-up phone call was made to the Perioperative Nurse Educators throughout the survey period. The Perioperative Nurse survey was compiled utilising the Qualtrics survey platform. There was a total of 52 questions, in the form of closed-ended, Likert scale and open-ended questions. The questions were developed from the qualities identified from the scoping review, including demographic questions of the perioperative nurses. The questionnaire was self-administered at a time convenient for each participant and was undertaken within the fourweek study timeframe. The average time taken to complete the online survey was 20 minutes.

Convenience and purposive sampling were used to recruit surgeons who met the inclusion criteria. Six surgeons known to the author were contacted directly to seek their participation in semi-structured interviews. Nine surgeons' unknown to the author utilising PNSA's were contacted via email with a follow-up phone call to establish their interest in participating in the study; their contact information was sought from private practice websites, including email addresses and phone numbers.

There were 13 questions developed for the surgeon interviews following the literature review, to generate discussion about the role of the PNSA. All interviews were conducted by telephone (due to COVID-19 related restrictions). The surgeons were provided with an information sheet and consent form, sent by email at least two days prior to the interview being undertaken. Verbal consent was then received prior to the interviews taking place. The interviews were audio recorded on a laptop computer utilising 'QuickTime audio recording'. Cloud function was disabled on the laptop and the files were saved directly to a secure Latrobe University Cloudstor drive. Following the interview, the recordings were transcribed; pseudonyms were used to de-identify participants to protect their privacy. The interviews varied in length depending on the discussion generated with each individual surgeon. The average duration of an interview was 21 minutes.

ANALYSIS

Following completion of the survey, the quantitative information was extracted from the Qualtrics system and organised within a Microsoft Excel document using nominal measurements for categorisation purposes. This allowed for ease of translation into the Statistical Package for the Social Sciences (SPSS) software system, so Chi Square analysis could be undertaken to test categorical variables. This was undertaken on the 55 nurse participant questionnaires that met all inclusion criteria.

The qualitative data was transcribed immediately following each interview. Once the data collection phase was complete, analysis took place. This involved line by line coding and looking for relevant themes. Relationships within the data were identified and organised into a summary of results. In addition, qualitative thematic analysis was undertaken with the three authors, and one Latrobe University academic personnel. This analysis included a 30-minute period for each member to study and identify themes from the interview transcripts followed by a 30-minute conversation.[30] This was undertaken to reduce potential bias that could occur from individual analysis. The conversation was recorded and used to further document results and form a robust discussion.

Triangulation between the qualitative and quantitative data was then performed to find common areas of interest, as well as any major contradictions. Data triangulation occurred from the perioperative nurse and surgeon groups, where the top five qualities were similar between perioperative nurses and surgeons.[31] To triangulate results, a points system was allocated. The top qualities identified by each group (perioperative nurses or surgeons) were given five points, the next was given four points and this allocation continued.

QUALITATIVE RESULTS

SURGEON PERSPECTIVES

1. Perceived benefits of the PNSA

Overall, the five surgeons interviewed all agreed that the role of the PNSA is highly beneficial in a variety of ways. The surgeons were verbally informed of the benefits identified in the scoping review and asked to comment on each and further asked to rank what they believe were the top three most important. No surgeons refused to continue to participate in the survey once it had commenced, and an average of 21 minutes was taken to complete the interviews via phone. Table 1 displays the ranking from the surgeon responses in perceived benefits and qualities of the PNSA.

TABLE 1: SURGEON'S MOST IMPORTANT PERCEIVED QUALITIES OF THE PNSA

Benefit/Attributes	Points	Rank
Knowledge of anatomy, instruments and surgical procedures	9 pts	1st
Continuity/Consistency	8 pts	2nd
Collaboration	4 pts	3rd
Educational Resource to perioperative team	3 pts	4th
Leadership	2 pts	5th

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Continuity and consistency were identified by the surgeons to have the same meaning. When surgeons mentioned continuity, this related to having a consistent person in the role of surgical assistant; different to the separate benefit, identified in the scoping review, of 'continuity of care', which relates more to benefits in patient care. S1: "We really like the continuity rather than having a doctor who is different every few weeks." S2: "Once you work with the same person over a period of time, you establish a working relationship where the assistant can assist you more effectively in an operation." S3: "I find it gives much better continuity with assistance, otherwise you can get anyone assisting you each time and especially for robotic [surgical] cases, it's really important to have someone who knows the robot and is familiar with how the surgeon operates because there's a great variety in surgical assisting abilities, especially with people who are robotic trained as well."

Knowledge and surgical competence were identified as 'individual' specific attributes, as it depends on the background and training of each PNSA. All surgeons identified the PNSA plays a role in perioperative staff education; this was especially attributed to the use of specialised robotic equipment. When asked about patient advocacy as a PNSA quality, the surgeons agreed the PNSA is a good patient advocate.

Reduction of surgical site infections (SSI) were identified by the scoping review as a potential benefit of the NMSA; however, the surgeons interviewed mostly disagreed that SSI reduction could be attributed to the use of a PNSA. While one surgeon mentioned that additional operating theatre efficiency could have an impact on the reduction of SSI, most (n=3) stated the fundamental practice of aseptic technique would not differ based on the surgical assistant and did not support the notion reduction of surgical site infections was specific to the PNSA role.

2: Change in Theatre Dynamic

The collaboration and leadership skills identified enables the PNSA to positively change the dynamic in the operating theatre, by linking nursing and medical staff. S1: "I think it's a different role because it's a link. It's a link role between the nursing staff and the surgeon. It's almost like a hybrid role." When specifically discussing operating theatre collaboration, all five surgeons mentioned that the PNSA plays an important role. Working as a link between perioperative nursing and medical teams was seen as an integral benefit of the PNSA. S2: "The nurse assistant is an integral part of the surgery so collaboration between the surgeon and the assistant is critical." S4: "It's not so much what you say or even how you say it, it's where it comes from, and because of the different power dynamics between me [surgeon] and the others, I think, compared to the PNSA, I think it changes all of that." The term 'making sure' was identified throughout numerous interview transcripts offering reassurance for the surgeons. The word 'streamlined' was also mentioned within this area demonstrating continuity and efficiency.

3: Risks, Limitations & Opportunities

Training of PNSA's was identified by one surgeon (S1) as a potential risk to patients from utilising a non-medical assistant; however, it was also noted by the same surgeon, that once a PNSA has been properly and fully trained within their specialist area of practice, the risk is not only reduced, but it is less than utilising varying assistants due to the consistency of practice. Emergency intraoperative management of situations, such as major haemorrhage was also identified as a potential risk (S4) of having a PNSA because the PNSA may not have undertaken adequate surgical training in various specialties to manage all complications that may occur, but it was also noted by one of the surgeon participants (S5) that this is a risk no matter who is in the position of surgical assistant.

Numerous limitations of the PNSA role were identified throughout the interviews. Remuneration for the service provided by the PNSA is not currently covered by Medicare (MBS). The current lack of Medicare Benefit Schedule provider numbers (mechanism for remuneration through Medicare) for PNSA's means the patient potentially incurs further costs to receive specialised surgery. With the NP being the only APN role recognised in Australia, the consensus from the surgeon group was that the PNSA role and the NP role were comparable with regards to benefits within their specialist areas of practice.

There was contention offered as one surgeon (S2) who identified the responsibility of the NP to being more involved than the PNSA, while another (S3) suggested they were comparable, because they both provide specialist care within the area, they are skilled. The continuity and collaborative nature of the NP and PNSA roles demonstrate similarities, "They're similar and I think they're definitely comparable and can potentially have just as much impact as each other" (S1). S5 also suggested the benefits offered to the team and healthcare system are comparable while S4 stated "the PNSA is arguable more useful". Remuneration, among other issues, contributes to the lack of PNSA's undertaking training and therefore, their availability to assist surgeons. Opportunities for the role within South Australia were discussed with the surgeons. It was noted that current opportunities are somewhat limited due to the nature of the current remuneration systems.

PERIOPERATIVE NURSES

In total, 55 surveys were deemed valid as five did not meet the inclusion criteria of having ever worked with a PNSA. Participants were asked demographic information to enable results to undergo Chi square testing to identify variables amongst the population based on their specialty and experience (Table 2):

TABLE 2: PERIOPERATIVE NURSE DEMOGRAPHICS

	n	%
Perioperative Role		
Scrub Nurse/Technician	38	72
Scout Nurse/Technician	28	53
Anaesthetic Nurse/Technician	16	30
Other	2	4
State or Territory		
New South Wales	1	2
South Australia	52	98
Healthcare Setting		
Public Hospital	2	4
Private Hospital	53	100
Private Practice	1	2
Surgical Specialty		
General/Colorectal/Bariatric	25	47
Urology	47	89
ENT	5	9
Cardiac	1	2
Plastic/Reconstructive	3	6
Gynaecology/Obstetrics	6	11
Orthopaedics	6	11
Vascular	3	6
Other	9	17

	n	%
Age Group		
20-29	8	15
30-39	26	49
40-49	13	25
50-59	4	8
60+	2	3
Sex		
Male	11	21
Female	42	79
Years of Periop Experience		
< 2 years	0	0
3-5 years	11	21
5-10 years	17	32
10+ years	25	47
Years with PNSA		
< 1 year	9	17
1-2 years	31	58
3-4 years	8	15
5+ years	5	10

1. Perceived Benefits of the PNSA

The perioperative nurse group identified all the benefits presented within the scoping review as being indicative of the PNSA role. Attributes in order of rank are listed along with their percentage of respondents (Image A):

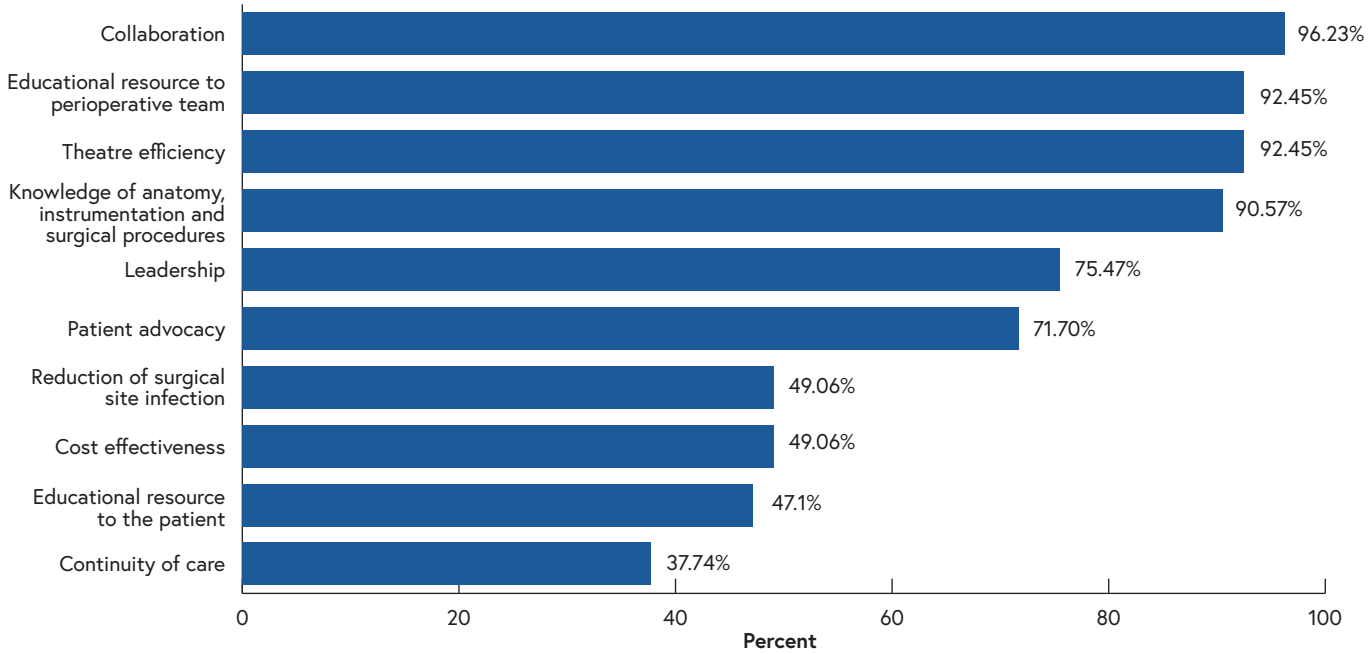

FIGURE 1: PERCEIVED PERIOPERATIVE NURSE BENEFITS OF THE PNSA

TABLE 3: PERIOPERATIVE NURSES' MOST IMPORTANT PERCEIVED QUALITIES OF THE PNSA

Benefit/Attribute	Responses x 3	Responses x 2	Responses x 1	Total	Rank
Knowledge of Anatomy, Instrumentation and Surgical Procedures	19 x 3 = 57	11 x 2 = 22	2 x 1 = 2	81	1
Theatre Efficiency	8 x 3 = 24	13 x 2 = 26	10 x 1 = 10	60	2
Collaboration	6 x 3 = 18	12 x 2 = 24	15 x 1 = 15	57	3
Educational Resource to Perioperative Team	10 x 3 = 30	6 x 2 = 12	10 x 1 = 10	52	4
Patient Advocacy	5 x 3 = 15	4 x 2 = 8	5 x 1 = 5	28	5
Leadership	2 x 3 = 6	2 x 2 = 4	1 x 1 = 1	11	6
Cost Effectiveness	0 x 3 = 0	0 x 2 = 0	5 x 1 = 5	5	7
Continuity of Care	0 x 3 = 0	2 x 2 = 4	0 x 1 = 0	4	8
Reduction of SSI	0 x 3 = 0	1 x 2 = 2	1 x 1 = 1	3	9
Educational Resource to the Patient	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	3	9

Other benefits and qualities identified by the perioperative nurse group were consistency within the operating theatre, insight and understanding of how the perioperative process works from a nursing point of view, communication, and provision of a holistic spectrum of care.

Significant associations ($p < 0.001$) were demonstrated between the instrument and circulating (Scrub/Scout) and Anaesthetic nursing roles with all responses relating to benefits, risks, and limitations of PNSAs. Similarly, there were significant associations ($p<0.001$) between 'years working with a PNSA' and 'years of perioperative experience' with all survey responses. This identified that nurses of all ages, background and experience demonstrated uniform responses adding to the validity of the results. Perioperative nurses were asked to identify the three most important qualities of the PNSA. A point system was applied to enable ranking of these qualities, with responses displayed in Table 3:

While not rating SSI reduction highly on the list of qualities, perioperative nurses saw it as an area the PNSA can have an impact. One hundred percent (n=51) of respondents that provided an answer for this question, demonstrated they believed the PNSA's previous career as an instrument nurse (scrub nurse) positioned them well to understand and practice a high level of aseptic technique. Further results regarding SSI reduction are displayed in Table 4.

2: Change in Theatre Dynamic

Collaboration, leadership, and consistency were three key qualities identified as being highly indicative of the PNSA role. These are benefits that can be linked directly to the ability of the PNSA to add to a positive operating theatre dynamic. The perioperative nurse group were asked a series of questions on these attributes with the results displayed in Table 5.

TABLE 4: PERIOPERATIVE NURSES' RESPONSES TO SSI BASED QUESTIONS

	n=	%
Do you think a PNSA's knowledge of surgeon preferences leads to shorter operating times?		
Yes	45	92
Unsure	4	8
No	0	0
Does the PNSA utilise the practice of double gloving for invasive surgical procedures?		
Yes	47	92
Unsure	2	4
No	2	4
Do you believe the PNSA understands and follows the policies and protocols set by the hospital/healthcare facility with regards to sterile technique, double gloving and SSI?		
Yes	50	98
Unsure	0	0
No	1	2
With regards to sterile technique, how would you rate the ability of the PNSA?		
Higher than average	43	84
Average	7	14
Lower than average	0	0
Unsure	1	2

TABLE 5 – PERIOPERATIVE NURSES' RESPONSE TO QUESTIONS BASED ON 'CHANGING THEATRE DYNAMIC'

	n=	%
Do you think the PNSA enhances communication between the nursing and medical teams in the operating theatre?		
Yes	45	87
Maybe	7	13
No	0	0
Do you see the PNSA as a leader in theatre?		
Yes	33	62
Maybe	16	30
No	4	8
Do you look to the PNSA for guidance?		
Yes	45	85
Maybe	6	11
No	2	4
Do you think the PNSA has an effect on the culture within the operating theatre?		
Yes	49	92
No	4	8
Do you think this is a positive or negative effect?		
Positive	47	100
Negative	0	0

Despite the quantitative nature of the survey, the perioperative nurse survey contained open-ended questions, with responses reflecting how the PNSA contributes to both the medical and nursing teams, acting as a link and, in turn, improving the operating theatre dynamic. Multiple perioperative staff identified the PNSA is more approachable than a medical assistant.

> *"They are not only part of the medical team but also part of the nursing team."* Respondent 27

> *"The PNSA is more engaged with the whole team which links nursing and medical staff."* Respondent 1

Further to the theme of a change in operating theatre dynamic, was the perioperative nurse's perceptions of the PNSA's insight into the workings/operations of the operating theatre process.

> *PNSA's not only fulfil the role of a medical assistant, but also understands and assists nursing roles in the perioperative space."* Respondent 21

> *"The PNSA is more in touch with theatre needs in regard to equipment and setup. They have a comprehensive understanding of the scrub/scout role and can help troubleshoot or suggest ideas to the nursing staff."* Respondent 15

> *"The PNSA has better skills in anticipation throughout the case and supporting the whole theatre team."* Respondent 41

> *"The PNSA's greater understanding of theatre protocol makes them a greater hand during and after the surgery. They seem to have a greater understanding of the small jobs required in the setup and more of an understanding of the instruments used. It seems they are more flexible and better communicators with the nursing staff."* Respondent 22

3. Risks, Limitations & Opportunities

There was minimal risk identified by the perioperative nurse group of the PNSA role. "Emergency situations" (none specifically identified) were identified as one potential risk and that the PNSA may not be able to lead care in the event of the surgeon becoming incapacitated, as this would delve outside the PNSA's scope of practice. Limitations identified by the perioperative nurse group include misconceptions of the role within the healthcare system and community, as well as remuneration issues from the lack of access to MBS funding.

TRIANGULATION OF RESULTS

Data triangulation occurred from the perioperative nurse and surgeon groups, where the top five qualities were similar between perioperative nurses and surgeons.[31] To triangulate results, a points system was allocated. The top qualities identified by each group (perioperative nurses or surgeons) were given five points, the next was given four points and this allocation continued (Table 6).

TABLE 6: MOST IMPORTANT QUALITIES OF THE PNSA

	Surgeons	Perioperative Nurses	Points Allocated
1.	Knowledge of anatomy, instrumentation and surgical procedure	Knowledge of anatomy, instrumentation and surgical procedure	5 points
2.	Consistency	Theatre efficiency	4 points
3.	Collaboration	Collaboration	3 points
4.	Educational resource to the perioperative team	Educational resource to perioperative team	2 points
5.	Leadership	Patient Advocacy	1 point

DISCUSSION

The qualities surgeons and nurses believe the PNSA possesses and offers to the perioperative team have been clearly identified and combine to form a series of phenomena that can change the dynamic of the entire perioperative team, embracing a more unified working environment, contributing to a positive professional culture, which may contribute to positive patient outcomes.

Smith et al. (2016) identified leadership, surgical experience, patient set-up and the PNSA as a resource in the operating theatre to be the major benefits of the PNSA at a hospital in Queensland, Australia.[27] Smith et al. (2016) surveyed 12 PNSAs, 13 surgeons and 35 perioperative staff.[27] This study in South Australia has solidified these as major benefits and has identified numerous others that demonstrate the effectiveness of the role. The PNSA's knowledge of anatomy, instrumentation and surgical procedures in which they practice was the most important attribute identified by both surgeon and nurse groups, reinforcing the apparent benefit the PNSA contributes to the surgical experience.[27]

Collaboration was identified as the third most important quality of the PNSA by both the surgeons and nurses. The operating theatre is traditionally a hierarchical environment, where the importance of teamwork cannot be underestimated. A good team is a "group of people that are interdependent and bound together by their reliance on each other".[32 p174] Open communication amongst team members can prevent errors from occurring in the operating theatre and, therefore, reduce the risk of harm to patients.[33] The PNSA, attributed with extensive collaboration, communication and leadership skills has the ability to change the dynamic within the operating theatre, and generate a positive professional culture within the operating theatre. Utilising these skills, the PNSA can generate cohesion between medical and nursing teams, increase communication and enhance efficiency, a notion supported by the perioperative nurses in this study, by identifying operating theatre efficiency as the second most important quality of the PNSA. The perioperative nurses and surgeons consider the PNSA to have an understanding and perspective of both the surgical and nursing roles within the perioperative environment, in ways a medical assistant may not.

The PNSAs insightful perspectives of both the surgical and nursing consideration of surgical care, may result in an improved professional culture by optimising communication between both professional domains and facilitating improved communication between the entire perioperative team. Teams that work in close collaboration have confidence, trust, and support in each other and maintain team attachment to achieve positive outcomes.[32,33] The majority (92%, n=49) of perioperative nursing staff agree the PNSA has a positive effect on the culture within the operating theatre, a theme strongly echoed by the five surgeons interviewed.

Collaboration was also associated with collegiality, where collegiality emerged as a strong phenomenon from the surgeons in this study. Once a surgeon reaches the level of consultant, they practice within a more independent environment and are rarely afforded the opportunity to observe how other surgeons undertake the same procedure. For PNSAs that work with a number of different surgeons, the collaborative nature of surgery and trust the PNSA develops with a surgeon may provide opportunity for new and innovative approaches for a procedure to be considered, as postulated by the surgeons interviewed.

Consistency was a quality of the PNSA that emerged as a strong theme within the surgeon interviews, and a theme which has recently emerged in current literature.[28] Consistency related to having the same assistant in the form of a PNSA, rather than rotating personnel to assistant with surgery. Consistency and dependability of the PNSA is particularly suited to highly technical specialist surgical domains and a quality valued by the surgeons interviewed.[28] This consistency in patient care and surgical assistance from the PNSA linked to the theme of 'reassurance' which emerged from this study. The perioperative nursing staff expressed assurance (in free text responses) knowing the experience and consistency of practice of the PNSA provides a continuum of perioperative care, as well as providing a broad perspective and insights into the holistic needs of the patient. The majority of perioperative nurses (92% n= 45) supported the notion the PNSA's knowledge of surgeon preferences leads to shorter operating times, which subsequently contributes to enhanced operating theatre efficiency.

The contribution of the PNSA to reducing surgical site infection (SSIs) generated incongruous results between the surgeons and perioperative nurses, with 84% (n=43) of perioperative nurses perceiving PNSAs to have a 'higher than average' adherence to sterile technique. The perioperative nurse group (84% n=43) felt the PNSA offers a higher-than-average level of aseptic technique, driven by their experience as a perioperative instrument nurse (scrub nurse) and their adherence to policies relating to sterile technique, double gloving and SSI; an area where research has identified perioperative nurse specialists have the ability to reduce SSI rates.[6,11,34] The surgeons interviewed either did not substantiate the findings from current literature or disagreed PNSAs contributed to a reduction in SSIs. A comprehensive study across multiple sites assessing SSI rates would identify the basis of a correlation between utilising PNSA's and SSI reduction; this is an area for future investigation.

Barriers to perioperative nurses pursuing PNSA roles in Australia were explored in this survey and were identified to be associated with the cost of education, amount of study

and the amount of PNSA work available. The perioperative nurses also identified the PNSA role should be viewed as an APN role in Australia. The potential barriers to perioperative nurses becoming PNSAs was explored in the research to identify future potential workforce shortfalls, due to a projected increased demand for surgical services.[23, 29] PNSAs contribute to the provision of surgical service delivery in rural public health services, where demonstrated doctor shortages exist and advanced practice nurses are required to meet future service demand.[2, 23] With barriers to perioperative nurses pursuing the role of PNSA in Australia; however, and ongoing obstacles relating to professional recognition and accredited remuneration pathways for PNSAs, an expanding PNSA workforce or broader scope of practice for improved surgical patient care is improbable in the imminent future, and a challenge for the distant future.

The surgeon group identified there is some risk of utilising a PNSA, although it was not substantiated if the risk is any greater than with a medical surgical assistant. The limitations of this research relate to the broader applicability of the findings due to a small surgeon sample size (five surgeons) who primarily undertake minimally invasive robotic assisted surgery in the urological specialty and all research respondents practicing in private hospitals in South Australia. The role of the PNSA in South Australia is in its infancy with a high proportion working in the specialised field of robotic surgery, which is not a direct reflection of the broader PNSA roles undertaken in Australia. Greater participation numbers by both surgeons and perioperative nurses were limited by COVID-19 restrictions of social distancing and elective surgical practice at the time of the research. Social desirability bias, where participants answer questions in a manner, they deem to be more socially acceptable, to project a favourable image of themselves is a potential relationship limitation, as one researcher was known to approximately 50% of the perioperative nurse and 80% of the surgeon population, despite communication and advertisement of the study circulated by an impartial nurse educator. Further research is required to explore the benefits and qualities the PNSA contributes to the surgical team, patient and healthcare system to demonstrate the broader applicability of the qualities identified of the PNSA from this study.

CONCLUSION

The PNSA positively impacts the perioperative culture within the operating theatre, contributes to enhanced collaboration between the perioperative team and offer non-technical qualities to the patient's surgical experience. The consistency the PNSA conveys to both surgeons and perioperative nurses offers reassurance to the perioperative team, which is perceived to improve operating theatre efficiency. With further recognition and regulation of the role in Australia, there are opportunities for the PNSA to have a broader scope of practice in surgical service delivery and a greater impact of patient care.

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