

Factors that predict evidence use by Australian perioperative nurses

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Abstract

Evidence-based practice has been demonstrated to positively impact patient outcomes; unfortunately, there are many factors that hinder the use of research evidence by healthcare clinicians. Our previous study reported a multisite survey assessing Australian perioperative nurses knowledge, practice, attitude, and perceived barriers to evidence use. This subsequent analysis used univariate and multivariate binary logistic regression with odds ratios (OR) and 95% confidence intervals (CI) to compare individual nurse and organisational characteristics with high evidence-based practice (EBP) use. Two individual nurse characteristics found to be related to EBP were postgraduate qualifications (OR 1.69, 95% CI 1.07–2.6, $p=0.02$) and previous research experience (OR 1.9, 95% CI 1.6–2.4, $p=0.01$). Organisational characteristics related to EBP included access to the internet (OR 2.04, 95% CI 1.3–3.0, $p=0.001$) and access to ongoing EBP education (OR 1.6, 95% CI 1.1–2.5, $p=0.01$). Previous research experience (OR 1.6, 95% CI 1.0–2.3, $p=0.01$) was the only independent predictor of EBP. Given our finding, we suggest that considerably greater effort be made to facilitate nurses involvement in research studies in the perioperative setting.

Keywords

Evidence-based practice, perioperative nursing.

Background

It is now widely accepted by clinicians, the community, and regulatory agencies that clinical care should be based on the best available research evidence. Perioperative nursing scholars, however, have expressed concerns that our profession may not be meeting these expectations¹. Many examples of substantial evidence-practice gaps can be found in this very journal and others that support these concerns²⁻⁴. The ongoing struggle with translating evidence into practice has led to calls for an increased focus on research and research utilisation to ensure the continued growth of the perioperative nursing specialty⁵.

The barriers to evidence-based practice (EBP) and strategies to increase evidence use by nurses have been the focus of a growing body of research. Two systematic reviews have identified the complexity of, and challenges with, integrating research evidence into nursing practice^{6,7}. The reviews synthesise the findings of prior studies to identify individual nurse and organisational factors that influence and are predictors of EBP use.

Squires *et al.*⁶ reviewed 45 studies to examine the relationship between individual nurse characteristics and EBP. The characteristics identified from the reviewed studies can broadly be categorised into demographics (age and sex), professional characteristics (role, designation, and qualifications), and exposure (previous research experience and ongoing EBP education). The authors of the review acknowledged significant variation in the findings of the included studies, but, in general, concluded that postgraduate qualification, current role,

information seeking, and clinical specialty were significantly related to EBP.

In their review of 10 studies, Meijers *et al.*⁷ examined the relationship between contextual factors (including organisational characteristics) and EBP in nursing. The organisational characteristics identified by the authors can broadly be categorised into research resources, structural supports and skills, education and training. Again, there was a significant variation identified between the included studies, but the authors did report a relationship between EBP and access to resources, multifaceted research support, time for research activities, and provision of education.

The findings of these reviews offer the potential for researchers and educators to develop specifically targeted interventions aimed at increasing EBP in nursing⁸. Although the findings are beneficial, both reviews identify that many of the included studies had substantial methodological problems. The authors recommend that the findings be replicated in further research using more robust study designs, larger samples and multivariate assessment methods^{6,7}.

In this paper we aim to contribute to this body of knowledge by analysing data from a large survey of Australian perioperative nurses⁹ using multivariate binary logistic regression analysis to identify individual nurse and organisational characteristics significantly related to EBP.

Method

Univariate binary logistic regression with odds ratios (OR) and 95% confidence intervals (CI) were used to identify relationships between individual nurse and organisational characteristics and EBP. Statistically

significant ($p < 0.05$) relationships were entered into a multivariate regression model with forward conditional elimination to identify independent predictors of EBP.

Participants were categorised as either having high levels of EBP (top quartile) or low levels based on the “evidence use” subscale of the survey¹⁰. Individual participant characteristics compared were sex, age, perioperative experience, employment status, role, designation, highest nursing qualification, time since latest qualification, and previous EBP experience. Characteristics of the organisation compared included the sector (public or private), number of operating rooms, access to medical library, medical librarian or research databases, access to the internet or non-clinical computers, access to nurse educator, clinical nurse consultant, ongoing EBP education, or academic unit.

The univariate analysis of the relationship between individual nurse and organisation characteristics are presented in Tables 1 and 2 with number and percentage plus OR and p-value. Statistically significant characteristics entered into the multivariate analysis are presented in Table 3 with B Wald scores plus OR and p-value.

Results

Individual nurse characteristics and EBP

According to the univariate analysis (Table 1) there were no significant relationships between a nurse's age, sex, perioperative experience, employment status, role, designation, time since last nursing qualification, previous EBP training, and reported EBP. Postgraduate education (OR 1.69, 95% CI 1.07–2.6,

Individual nurse characteristics		High EBP		Low EBP		OR (95% CI)	P=
		n/total	%	n/total	%		
Sex	Female	132/435	30%	303/435	70%	1	
	Male	15/49	30%	34/49	70%	1.00 (0.5–1.9)	0.97
Age (years)	<34	60/215	28%	155/215	72%	1	
	35 to 54	67/202	33%	135/202	67%	0.7 (0.5–1.18)	0.24
	≥55	20/66	30%	46/66	70%	0.8 (0.4–1.6)	0.70
Perioperative experience (years)	<9	82/274	30%	192/274	70%	1	
	10 to 19	40/112	36%	72/112	64%	1.2 (0.7–2.1)	0.40
	≥20	25/98	26%	73/98	74%	0.7 (0.4–1.2)	0.26
Employment status	Full-time	107/335	32%	228/335	68%	1	
	Part-time	38/145	26%	107/145	74%	0.78 (0.5–1.2)	0.21
Role	Direct patient care	123/413	30%	290/413	70%	1	
	Management	9/26	35%	17/26	65%	1.7 (0.5–5.7)	0.39
	Education/Consultant	9/19	47%	10/19	53%	2.1 (0.8–5.3)	0.11
Designation	Registered	107/372	29%	265/372	71%	1	
	Clinical nurse specialist	34/89	38%	55/89	62%	1.4 (0.4–4.3)	0.55
	Enrolled nurse	4/18	22%	14/18	78%	0.65 (0.4–1.05)	0.08
Highest qualification	Undergraduate / certificate	94/330	29%	236/330	71%	1	
	Postgraduate	43/107	40%	64/107	60%	1.69 (1.07–2.6)	0.02
Last nursing qualification (years)	<9	100/313	32%	213/313	68%	1	
	10 to 19	28/92	30%	28/92	70%	1.4 (0.8–2.5)	0.78
	≥20	19/78	24%	59/78	76%	1.07 (0.6–1.7)	0.19
Previous EBP experience	Previous research experience	71/143	50%	126/331	38%	1.9 (1.6–2.4)	0.01
	Previous EBP training	122/146	84%	259/332	78%	1.4 (0.9–2.3)	0.16

Table1: Univariate analysis of individual nurse predictors of EBP

p=0.02) and previous research experience (OR 1.9, 95% CI 1.6–2.4, p=0.01) were found to be statistically related to EBP.

Organisation characteristics and EBP

The univariate analysis of the organisational characteristics (Table 2) found that there were no significant relationships between EBP and a nurses' sector (public or

private), the number of operating rooms in their department, access to a medical library, medical librarian, research databases or a non-clinical computer, and access to a nurse educator, clinical nurse consultant, or academic unit. Access to the internet (OR 2.04, 95% CI 1.3–3.0, p=0.001) and access to ongoing EBP education (OR 1.6, 95% CI 1.1–2.5, p=0.01) were found to be significantly related to EBP.

Independent predictors of high EBP

The four individual nurse and organisational characteristics found to have a significant relationship with EBP were entered into a multivariate model (Table 3) to identify independent predictors of EBP. The multivariate analysis found that postgraduate qualifications, internet access, and access to ongoing EBP education were not independent predictors of EBP. Previous research, however, showed that experience was (OR 1.6, 95% CI 1.0–2.3, p=0.01).

Discussion

Results in context

Nurses with postgraduate qualifications (graduate certificate, graduate diploma, masters, or doctorate) in this cohort were almost 70% more likely to have high levels of EBP compared to those with an undergraduate degree or certificate only. This finding confirms the positive effect of postgraduate nursing education on EBP noted in previous studies of other nursing populations^{11–14}. Prior research education (theory) alone was not found to be significantly related to EBP; which is in keeping with prior published literature^{15,16}. Contrastingly, access to ongoing research education was found to be significantly related to EBP; whereas, previous published research has shown mixed effects on EBP^{15,17}. Although not conclusive, there appears to be some benefit from the feeling of support provided by access to ongoing education rather than one-off courses⁷.

Surprisingly, in this population of nurses from 10 different metropolitan hospitals, only 21% reported postgraduate qualifications⁹. A 2006 perioperative

Organisational characteristics		High EBP		Lower EBP		OR (95% CI)	P=
		n/total	%	n/total	%		
Sector	Public	91/307	30%	216/307	70%	1	
	Private	56/174	32%	118/174	68%	1.12 (0.7–1.6)	0.56
Number of operating rooms	< 10	99/338	29%	239/338	71%	1	
	≥ 10	48/143	34%	95/143	66%	1.2 (0.8–1.8)	0.35
Access to:	Medical library	108/148	73%	235/345	68%	1.2 (0.8–1.9)	0.28
	Medical librarian	63/148	43%	130/345	38%	1.2 (0.8–1.8)	0.30
	Non clinical computer	81/148	55%	165/345	48%	1.3 (0.8–1.9)	0.16
	Research databases	103/148	70%	210/345	70%	1.4 (0.97–2.1)	0.06
	Internet	118/148	79%	160/345	46%	2.04 (1.3–3.0)	0.001
	Clinical nurse consultant	86/148	58%	180/345	52%	1.2 (0.8–1.8)	0.22
	Clinical/ nurse educator	139/148	94%	307/345	89%	1.9 (0.9–4.0)	0.09
	Ongoing EBP education	108/148	73%	212/345	61%	1.6 (1.1–2.5)	0.01
	Research/ academic unit	60/148	41%	115/345	33%	1.3 (0.9–2.0)	0.12

Table 2: Univariate analysis of organisational predictors of EBP

Characteristics		B	Wald	OR (95% CI)	P=
Individual nurse	Postgraduate qualification	0.18	0.45	1.2 (0.6–2.0)	0.50
	Previous research experience	0.47	5.47	1.6 (1.0–2.3)	0.01
Organisation	Internet access	0.39	2.27	1.4 (0.8–2.4)	0.13
	Access to ongoing EBP education	0.068	0.06	1.07 (0.6–1.8)	0.80

Table 3: Multivariate logistic regression analysis of predictors of EBP

workforce report identified a historic decline in nurses with post basic specialisation (32% in 1997 and 29% in 2003)¹⁸. The report authors attributed this decline to the transfer of specialist nursing education to the university sector and the associated increase in costs and reduction in access. The results of this survey appear to confirm an ongoing decline. This is a worrying trend that should be addressed by the profession; particularly given the

specialised nature of perioperative nursing.

Nurses who reported having previous research experience (conducted or been involved in the conduct or research) in this study were twice as likely to have high levels of EBP compare to those with no prior experience. This reflects finding of previously published studies^{19–21} and confirms the overall benefit of research participation on EBP. It is acknowledged that undertaking research as a novice is difficult;

however, many hospitals have either a nursing research department, a nursing professor or some association with a university school of nursing through which support can be obtained¹. By engaging clinical perioperative nurses in research, we will start to generate an evidence base that is relevant to practice and thus highly amenable to implementation.

In this population, nurses with access to the internet at work were more than two times more likely to report high levels of EBP. Only 56% of the perioperative nurses in this population had internet access; in contrast to 90% of perioperative nurses in a comparable US study²². The same US study identified that the majority of nurses felt more comfortable finding research evidence on the internet than using research databases such as CINAHL²². Access to the internet for staff is a simple measure that health services could implement to immediately increase nursing staff's access to evidence for practice.

Implications for practice

In their paper on strategies for developing EBP in perioperative nursing, Osborne and Gardner¹ propose that a strategic response to increasing EBP needs to occur at three levels: the individual, the organisational, and the professional. The following paragraphs discuss potential practice implications for these three levels.

At the individual clinician level it can sometimes feel overwhelming to try and introduce evidence into our practice because our practice is so dependent on other members of the nursing and multidisciplinary team. This interdependence is often a strength but it can also provide a significant challenge when it comes to introducing changes

to practice. One strategy that the individual nurse does have control over is the choice to actively seek out the knowledge and skills to be an evidence-informed practitioner. EBP is a process that requires the ability to pose clinical questions; search, find and appraise the evidence; translate the evidence into practice; and evaluate the effects on practice²³. Postgraduate education, which we have noted is on the decline in our specialty, offers the opportunity to obtain these skills in a structured environment under the direction of academic experts.

At the organisational level, there is much that can be done to create a practice environment that facilitates EBP. In their landmark study, Thompson *et al.*⁸ observed thousands of hours of nursing practice to identify how clinical decisions are made and in which circumstances research evidence was used. The authors found that decisions were made on evidence rather than intuition when the decision-making process had more structure and when more time was available. The authors recommend the introduction of decision-making processes that provide structure and time into the clinical practice setting, such as practice development groups; learning collaboratives; multidisciplinary practice reviews; and journal clubs.

Organisations also need to provide the appropriate human and material resources to facilitate EBP. The lack of these resources has been identified as a significant barrier to research utilisation^{18,19}. In fact, there are growing calls for hospitals to take a proactive approach to knowledge translation by making substantial investment in “knowledge infrastructure”²⁴ including a medical library and librarian; online research databases; and internet access. Exemplar organisations are also investing in positions such as nurse

scientist, research fellow, and knowledge broker²⁵.

At the professional level in Australia there is increasing evidence of efforts to promote and support a culture of EBP. In her guest editorial in a recent edition of this journal, Associate Prof Brigid Gillespie described some of the initiatives ACORN has employed to promote EBP and recognise perioperative nursing research²⁶. In particular, A/Prof Gillespie pointed to the rigorous evidence-based *ACORN Standards* review process and the new annual \$20,000 ACORN research grant as two examples of the profession promoting EBP and perioperative nursing research.

Strength and limitations

This survey is the largest survey of evidence use by perioperative nurses and one of the largest surveys of evidence use in an Australian nursing population. It contributes significantly to the body of knowledge on factors related to nurses’ use of EBP by analysing a large data set using rigorous data analysis methods. Although the survey was conducted across 10 sites, it was limited to nurses working in the perioperative departments of metropolitan hospitals in one state. It should be acknowledged that the factors that influence EBP may be different in other states and in rural or remote regions. Replication of this study in other settings would provide a valuable insight in the variation of EBP across Australia.

Conclusion

EBP has been demonstrated to positively impact patient outcomes, yet nurses are still having difficulty incorporating it into their practice. This study identified that postgraduate qualifications; previous research experience; access to the internet; and ongoing

EBP education were significantly related to higher levels of EBP. These findings offer the potential for targeted initiatives to increase the capacity of perioperative nursing for EBP. In particular, we suggest that considerably greater effort be made to facilitate nurses’ involvement in research studies in the perioperative setting.

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