# The influence of personal characteristics on perioperative nurses' perceived competence: implications for workforce planning


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## KEYWORDS
Australian, operating room, survey, experience, specialty education



## ABSTRACT

### Objective
To examine the influence of personal characteristics on perioperative nurses' perceived competence.

### Design
A cross-sectional survey design was used.

### Setting
A census of 3,209 operating room nurses who were members of the Australian College of Operating Room Nurses across all Australian states and territories was invited to participate.

### Primary Outcome Measure
The Perceived Perioperative Competence Scale-Revised, a 40-item survey consisting of six subscales measuring the dimensions of perioperative competence was used.

### Results
A total of 1,044 usable surveys were analysed representing 32.5% of the accessible population. Across the six subscales, demographic predictors accounted for 5% to 33% of the variance in nurses' perceived perioperative competence.

### Conclusions
These results may inform workforce planning initiatives designed to address the needs of this diverse specialty group. Efforts to retain older nurses need to be centred on redesigning workplaces, increased remuneration and professional recognition, and integrating technology to promote efficiency and safety. Workforce planning should include strategies such as creating academic partnerships with universities, to provide perioperative nurses access to specialty education and advanced skills programs.

## INTRODUCTION

Nurses comprise approximately 50% of the global healthcare workforce and represent 55% of the Australian healthcare workforce (Australian Bureau of Statistics [ABS] 2008, World Health Organization [WHO] 2006). As nurses comprise the majority of healthcare professionals in acute care facilities, providing safe and appropriate healthcare relies on a sustainable and competent workforce to deliver optimal patient outcomes (ABS 2008, Aitken et al 1998). Yet nursing shortages and skill mix deficits continue to undermine the effectiveness of any healthcare system (WHO 2006, Buchan 2007, Productivity Commission 2005). Of concern is the imminent exodus of Baby Boomer nurses, the majority of whom are set to retire in the next decade—which equates to around 50% of nurses currently employed in Australia, Canada, the United States of America, and the United Kingdom (ABS 2008, Buchan 2007, Oulton 2006, WHO 2006). This international trend is similar for the perioperative workforce, which is also ageing (Australian Institute of Health and Welfare [AIHW] 2011c, McNamara 2005).

In Australia, as in many other developed countries, the number of surgeries completed is also rising. For instance in Australia, 1.9 million surgical separations were recorded in 2009-2010, a yearly increase between 2005-2006 of 1.5% for public patients and 4.6% for private patients (AIHW 2011a). Consequently, it is imperative that an appropriately trained workforce of OR nurses is available. As a starting point, gaining an understanding of the capabilities of the perioperative workforce will inform workforce planning that will ensure the continuation of high quality patient care and take into account the demographic profile of this diverse group. Clearly, competence is a critical determinant of role performance, however its relationship is not direct, and the relative contribution of other factors to role performance is difficult to disentangle. In particular, demographic characteristics such as age, gender, years of clinical experience, education, nursing role and employment status also may play a major role in determining nurses' perceived competence.

This paper reports the results of a national study of Australian perioperative nurses that examined the relationships between demographic characteristics and domains of perioperative competence. Currently, there is limited understanding of the extent to which demographic characteristics contribute to perioperative nurses' perceived competence and its domains.

## BACKGROUND

Across various clinical contexts, previous studies suggest that demographic characteristics such as age, gender, experience, education, nursing classification, hospital settings, and specialty area have a bearing on nurses' level of perceived competence (Gillespie et al 2011, Safadi et al 2010, Josefsson et al 2007, Lofmark et al 2006, Clinton et al 2005, Meretoja et al 2004, Tzeng 2004, Santiano and Daffurn 2003). While gender has been linked with competence previously, with male nurses posting higher levels of self-reported competence (Yang et al 2004), its influence remains fairly inconclusive given that more recent work has refuted this finding (Safadi et al 2010, Grönroos and Perälä 2008). Other research identified that older nurses reported higher levels of competence (Gillespie et al 2010, Grönroos and Perälä 2008, Clinton et al 2005). Nursing classification has been associated with the career development of nurses undertaking further education (Merretoja and Lieno-Kilpi 2003).

There is also a growing number of studies comparing nurses' competence on the basis of education, clinical experience and specialty area. Several studies conducted in Sweden and the UK have compared competence in relation to the level of educational attainment across generalist contexts (Josefsson et al 2007, Defloor et al 2006, Lofmark et al 2006, Clinton et al 2005). Yet others have examined specialty areas (i.e., critical care, perioperative) and found notable differences in nurses' levels of perceived competence (Gillespie et

al 2011, Safadi et al 2010, Defloor et al 2006, Meretoja et al 2004, Santiano and Daffurn 2003). However, the results of some of these studies were inconclusive, likely as a consequence of insufficient sample size.

In sum, the variation in study results highlighted here belies the need for a balanced staffing profile: Is this important? Indeed it would seem so. Because recruitment strategies may be influenced by the current staffing profile, it is essential to describe staffing profiles with respect to demographic and personal characteristics to ensure that appropriate recruitment strategies are implemented.

## METHOD

A correlational survey design was employed and data were collected during 2010. The objective was to measure the relative contribution of demographic and personal background variables (age, gender, nursing classification, experience, education, employment status) in order to explain variation in perceived perioperative competence of OR nurses in Australia.

### Sample

Nurses who were members of the Australian College of Operating Room Nurses (ACORN) were invited to participate in the survey. Registered Nurses (RNs) in both public and private hospitals who worked in clinical roles, education, management and/or combined perioperative roles were eligible to participate. Enrolled Nurses were excluded due to the differences in their scope of practice. Survey packets, with a reply paid envelope, were distributed to the 3,209 eligible nurses who were ACORN members at the time this study was undertaken. A reminder note was mailed to all respondents two weeks after initial distribution of survey packets.

It was estimated that a sample size of 372 was needed to achieve a power of .90 (alpha = .05) for an estimated R-squared of 0.05 in a multiple regression analysis (Polit, 2010). Assuming a conservative response rate of 25%, the number of nurse surveyed was deemed to be adequate.

### Data Collection

In this study, the Perceived Perioperative Competence Scale – Revised (PPCS-R) was used to measure OR nurses' perceived competence. The iterative development and validation of the 40-item PPCS-R was based on a series of earlier qualitative and quantitative studies (Gillespie et al 2012, Gillespie et al 2011, Gillespie et al 2009, Gillespie et al 2008, Gillespie et al 2007). The scale uses items on a 5-point scale ranging from (1) 'never' to (5) 'always'. Total scale scores can range from 40 to 200, with higher scores indicating greater levels of perceived competence. The PPCS-R is comprised of six subscales that measure different dimensions of perioperative competence in two broad domains: 'Experiential Knowledge' (Foundational Knowledge; Proficiency; Professional Development) subscales and 'Social Interaction' (Leadership; Collaboration; Empathy) subscales. Pscyhometric testing of the PPCS-R provided evidence of construct validity and strong internal consistency reliability for both the overall scale (Cronbach's alpha = .96) and all subscales, with alphas ranging from .82 to .89 (Gillespie et al, 2012).

Within the 'Experiential Knowledge' domain, the subscale Foundational Knowledge has nine items that signify technical skills, such as knowledge of instruments and procedures (Gillespie et al 2012). The six items in the Proficiency subscale include behaviours that typify skills built on clinical exposure necessary to gain experience. The Professional Development subscale has six items that capture behaviours centred on maintaining practice standards based on current knowledge, reading journals and awareness of organisational policies.

Within the '*Social Interaction'* domain, the Leadership subscale contains eight items that indicate behaviours focused on mentoring staff, delegating tasks and conflict management (Gillespie et al 2012). The six items

in the Collaboration subscale indicate behaviours which characterise seeking and rendering assistance, tailoring communications to the situation, and respect for other team members. Finally, the subscale Empathy contains five items that characterise behaviours around providing reassurance to perioperative patients, actively listening and establishing rapport.

Demographic and personal background data in regard to age, gender, years of perioperative experience, specialty education, nursing role, employment status, and state association membership were also collected.

Institutional approval was given by the Human Research Ethics Committees of the university and the Australian College of Operating Room Nurses (ACORN) Board. Consent was implied by the return of the completed survey.

### Data Analysis

Data were entered into Predictive Analysis Software (PASW Statistics®, version 18.0, Chicago, IL, 2010) for Windows, formally known as SPSS. Bivariate analyses were used to examine relationships between PPCS-R scores and individual nurse characteristics (Pearson's r for continuous variables such as age, ANOVA or t-tests for categorical variables such as gender). Variables that were significantly related ($p < .05$) to PPCS-R scores were included in the multivariate model. Bivariate results for multi-category nominal-level variables (e.g., employment status, nursing classification) were examined to ascertain how best to represent the characteristics as dummy variables for the multiple regression analysis. Insomuch as no nurse characteristics were considered theoretically 'a priori' to any other, simultaneous multiple regression was used to predict the total PPCS-R scores and the six PPCS-R subscale scores. Given the strong correlations among several predictor variables (e.g., age and number of years of OR experience), problems of multicollinearity were carefully examined. The criterion for acceptability of a variable was a tolerance of .10.

## RESULTS

A total of 3,209 surveys were distributed and 1,178 usable surveys were returned, resulting in a response rate of 36.7%. Of the completed surveys, 40 of the respondents were ENs and a further 94 respondents were not currently employed in the perioperative setting; these were excluded from the analysis, leaving 1,044 usable surveys.

Table 1 displays the demographic and personal characteristics of the sample. The respondents were predominantly female (93.5%), and the average age was 47.8 ±9.7 years with a range from 22 to 73 years. Respondents had considerable OR experience, with an average 19.9 ±10.5 years (range 1 to 50 years). Around 45% of the nurses in this sample worked in Clinical Nurse, Nurse Educator or Clinical Nurse Specialist roles. The majority (70.5%) of the sample had perioperative specialty education. In terms of membership in a regional professional organisation, respondents were predominantly from New South Wales (34.8%), Victoria (22.3%), or Queensland (18.7%).

Table 2 presents the descriptive statistics and the subscale scores in each competence domain, including means, standard deviations, score ranges, and reliability estimates. Assessment of actual score ranges with theoretically possible score ranges reveals scores across all six domains were positively skewed — that is, respondents were more likely to perceive high rather than low levels of perioperative competence.

**Table 1: Demographic Characteristics of Operating Room (OR) Nurses in the Sample (*N* = 1,044)**

| Demographic Characteristic | n* | % |
|---|---|---|
| Gender, female | 996 | 93.4 |
| Highest education | | |
| Certificate or Associate's degree | 187 | 17.6 |
| Baccalaureate | 127 | 11.9 |
| Graduate certificate | 443 | 41.5 |
| Graduate diploma | 219 | 20.5 |
| Masters or doctorate | 91 | 8.5 |
| Received perioperative specialty education | 754 | 71.0 |
| Nursing classification | | |
| RN | 359 | 33.6 |
| Clinical Nurse (CN) or CN specialist | 389 | 36.4 |
| Clinical Nurse Educator/Nurse Educator | 98 | 9.1 |
| Nurse Manager | 200 | 18.7 |
| Other | 23 | 2.2 |
| Employment status | | |
| Full-time | 541 | 50.6 |
| Part-time | 463 | 43.3 |
| Casual | 65 | 6.1 |
| Professional Membership[a] | | |
| NSWOTA | 370 | 34.8 |
| VPNG | 237 | 22.3 |
| PNAQ | 199 | 18.7 |
| ORNA | 101 | 9.5 |
| Other (SAPNA, TORN, NTPN) | 155 | 14.6 |

*Missing values not replaced

**Table 2: Means, Variability and Reliability for Subscales of the Perceived Perioperative Competence Scale—Revised (PPCS-R) (N=1,122)**

| Subscale Name (Number of items) | Mean (SD) | Actual range of scores | Possible range of scores | Cronbach's alpha |
|---|---|---|---|---|
| Foundational Knowledge (9) | 39.6 (4.7) | 11 – 45 | 9 – 45 | .89 |
| Leadership (8) | 33.5 (5.3) | 11 – 40 | 8 – 40 | .89 |
| Collaboration (6) | 27.1 (2.6) | 13 – 30 | 6 – 30 | .81 |
| Proficiency (6) | 26.7 (3.0) | 12 – 30 | 6 – 30 | .84 |
| Empathy (5) | 22.4 (2.8) | 8 – 25 | 5 – 25 | .86 |
| Professional Development (6) | 25.4 (3.5) | 13 – 30 | 6 – 30 | .86 |
| Total Scale (40) | 174.7 (18.0) | 68 – 200 | 40 – 200 | .96 |

### Regression Results

Virtually all nurse characteristics were significantly correlated with PPCS-R scale and subscale scores in bivariate analyses. An important exception was regional professional membership affiliation, for which group differences did not approach levels of statistical significance. Thus, membership affiliation was not entered in the multiple regression. The strong correlation between highest level of educational attainment and receipt of postgraduate perioperative specialty education led to the decision to omit general educational attainment in the multiple regression analyses.

Regression results for the total PPCS-R scale scores are presented in table 3. Demographic characteristics were moderately good predictors of overall levels of perceived competence, with 24% of the variance accounted for by 8 predictors ($p < .001$). Years of OR experience was an especially strong predictor of higher scores, as was having obtained postgraduate specialty education. With years of OR experience controlled, nurses' age was not a predictor of overall perceived competence, nor was current full-time employment. In terms of nurse role classification, having an RN classification was strongly associated with reduced PPCS-R scores ($p <.001$), whereas managers and educators had significantly higher scores, all else equal. Women had significantly higher overall perceived competency scores than men.

**Table 3: Simultaneous Regression of Total Perceived Perioperative Competence (PPCS-R) Scale Scores on Nurses' Characteristics (*N* = 1044)**

| Nurse Characteristics | b | SE | Beta | t | p |
|---|---|---|---|---|---|
| Age, years | .09 | .07 | .05 | 1.25 | .21 |
| Gender[a] | 4.89 | 1.97 | .07 | 2.48 | .01 |
| Years of OR experience | .44 | .07 | .26 | 6.43 | <.001 |
| Nursing classification: | | | | | |
| RN | -9.51 | 1.21 | -.25 | -7.88 | <.001 |
| Manager | 3.09 | 1.42 | .07 | 2.18 | .03 |
| Educator | 3.68 | 1.79 | .06 | 2.05 | .04 |
| Has perioperative specialty education | 3.44 | 1.11 | .09 | 3.10 | .002 |
| Employed full time[a] | 1.58 | 1.06 | .04 | 1.50 | .14 |
| Constant | 155.61 | 3.65 | | 42.70 | <.001 |

*Note.* Overall $R^2 = .24$, Adjusted $R^2 = .24$, $F$ (8, 1035) = 41.26, $p < .001$.

[a]Females = 1, males = 0. [b]Nurses working a regular fulltime schedule = 1; part-time workers and casual workers = 0.

Table 4 summarises regression results for the three PPCS-R subscales in the '*Social Interaction*' domain (Leadership, Collegiality and Empathy), and table 5 shows regression results for the three subscales in the '*Experiential Knowledge*' domain (Foundational Knowledge, Proficiency, and Development). As these two tables show, different characteristics emerged as predictive of different competencies. Years of OR experience, for example, was strongly predictive of the three 'skill-set' subscale scores and of Leadership scores; yet, a nurse's age (but not OR experience) predicted high scores on Collegiality and Empathy. The older the nurse, the stronger the perception of competence in these two areas, even with experience held constant.

Gender was a significant predictor on three subscales: Foundational Knowledge, Professional Development and Leadership. On these three scales, women had significantly higher scores than men, net of other characteristics. Men and women did not differ, however, in their perceived degree of competence on the Proficiency, Collegiality, and Empathy subscales.

In terms of nursing classification, being classified as an RN was negatively and significantly associated with all six subscale scores, even when age, years of OR experience, and postgraduate specialty education were controlled. Being a manager predicted higher Leadership scores, and being an educator was associated with significantly higher Leadership and Professional Development scores.

**Table 4: Simultaneous Regression of *Social Interaction* Subscales[a] of the Perceived Perioperative Competence (PPCS-R) Scale Scores on Nurses' Characteristics (*N* = 1044)**

| Nurses' Characteristics | Leadership | | Collegiality | | Empathy | |
|---|---|---|---|---|---|---|
| | Beta | p | Beta | p | Beta | p |
| Age, years | .00 | .91 | .12 | .01 | .22 | <.001 |
| Gender[b] | .07 | .01 | .05 | .12 | .04 | .20 |
| Years of OR experience | .27 | <.001 | .06 | .19 | -.06 | .22 |
| Nursing classification: RN | -.33 | <.001 | -.13 | <.001 | -.09 | .02 |
| Nursing classification: Manager | .12 | <.001 | .04 | .22 | .05 | .17 |
| Nursing classification: Educator or Clinical Nurse Educator | .08 | .003 | .02 | .45 | .06 | .08 |
| Has perioperative specialty education | .05 | .04 | .05 | .09 | .05 | .11 |
| Employed full-time[c] | .08 | .004 | -.04 | .27 | -.00 | .87 |
| $R^2$ | .33 | | .06 | | .06 | |
| Adjusted $R^2$ | .33 | | .06 | | .05 | |
| *F* (8, 1035) | 63.77*** | | 8.79*** | | 7.57*** | |

[a]The three subscales of the PPC-R that focus on interaction with other staff (Collegiality and Leadership) and patients (Empathy). [b]Females = 1, males = 0. [c]Nurses working a regular fulltime schedule = 1; part-time workers and casual workers = 0.

***For all three subscales, the overall regression model was statistically significant at $p < .001$.

**Table 5: Simultaneous Regression of *Experiential Knowledge* Subscales[a] of the Perceived Perioperative Competence (PPCS-R) Scale Scores on Nurses' Characteristics (*N* = 1044)**

| Nurses' Characteristics | Foundational Knowledge | | Proficiency | | Professional Development | |
|---|---|---|---|---|---|---|
| | Beta | p | Beta | p | Beta | p |
| Age, years | -.10 | .01 | -.02 | .68 | .13 | .002 |
| Gender[b] | .07 | .01 | .03 | .26 | .06 | .03 |
| Years of OR experience | .37 | <.001 | .31 | <.001 | .16 | <.001 |
| Nursing classification: RN | -.19 | <.001 | -.21 | <.001 | -.18 | <.001 |
| Nursing classification: Manager | .03 | .31 | .03 | .36 | .03 | .38 |
| Nursing classification: Educator or Clinical Nurse Educator | .01 | .28 | .02 | .57 | .10 | .002 |
| Has perioperative specialty education | .09 | .002 | .10 | .001 | .08 | .004 |
| Employed full-time[c] | .04 | .23 | .02 | .52 | .07 | .02 |
| $R^2$ | .20 | | .20 | | .17 | |
| Adjusted $R^2$ | .20 | | .20 | | .16 | |
| *F* (8, 1035) | 33.05*** | | 32.56*** | | 25.91*** | |

[a]The three subscales of the PPC-R that focus on knowledge gained through clinical exposure. [b]Females = 1, males = 0. [c]Nurses working a regular fulltime schedule = 1; part-time workers and casual workers = 0.

***For all three subscales, the overall regression model was statistically significant at $p < .001$.

Having postgraduate perioperative specialty education positively predicted all the 'skills-set' subscale scores, and also scores on the Leadership subscale, similar to the results for years of OR experience. Postgraduate specialty education was not, however, associated with higher scores on the Collegiality and Empathy subscales. Finally, full-time employment (as opposed to casual or part-time employment) was associated with higher Professional Development and Leadership scores.

Taken together, the demographic characteristics used in these analyses were especially powerful in predicting perceived Leadership competence. For this subscale, the proportion of variance explained by the demographic variables was .33. Nurses' background characteristics were not especially powerful, however, in predicting Collegiality (adjusted $R^2$ = .06) or Empathy scores (adjusted $R^2$ = .05). Nevertheless, the large sample size in this study ensured that even modest values for $R^2$ were statistically significant (all six subscales, $p < .001$).

## DISCUSSION

The overall aim of this study was to measure the relative contribution of demographic characteristics to nurses' perceived perioperative competence. The nurses in this study perceived they had relatively high levels of competence overall. These results suggest that demographic characteristics were generally good predictors of overall levels of perceived competence. To our knowledge, this is one of the first studies to assess the relative contribution of demographic characteristics to perceived perioperative competence and its domains. At the time that this study was conducted, there were approximately 19,303 nurses practising in perioperative settings Australia-wide (AIHW 2011b). Based on these national data, our accessible sample represents roughly 17% of the total number of perioperative nurses practising in all Australian states and territories. Having access to a considerably large sample of nurses allowed us to perform robust analyses using multiple regression and thus permitted the detection of small but significant statistical differences.

After controlling for the effects of clinical experience, nurses' age was not a predictor of overall competence in our study, which accords with earlier research findings (Grönroos and Perälä 2008, Tzeng 2004). At the time this study was conducted, the average age of Australian nurses practising across all specialities was 43.4 years (AIHW 2011b); several years younger than the perioperative nurses in our study sample. In this study, age was a predictor of four out of the six competence domains. It seems intuitive that older nurses reported higher levels of competence in the *'Experiential Knowledge'* domains of Foundational Knowledge and Professional Development; and two *'Social Interaction'* domains: Empathy and Collegiality. These results suggest that as perioperative nurses get older, they develop greater capacity to extend beyond the technical skills to those of 'caregiver', epitomised by a deeper understanding of, and compassion for, the patient on a psychological level (Gillespie et al 2009, Bull and FitzGerald 2006, Zhang et al 2001).

Interestingly, gender was both a predictor of nurses' overall competence and three of its domains—namely, Leadership, Foundational Knowledge and Professional Development. Our study showed that women reported significantly higher scores of perceived competence across these domains than their male counterparts. This result runs counter to earlier research where male nurses reported higher scores in applying knowledge and a strong desire for personal growth and professional promotion (Yang et al 2004). Our results also suggest that male and female nurses' perceptions of perioperative competence are not necessarily based on conventional conceptions of tasks and roles (Fisher 2011, Rozier 1996). Contrary to stereotypical gender-dominated assumptions, leadership is perceived to be central to perioperative competence for the female nurses in this study. Yet surprisingly, the proportion of males and females in management roles in the current study was slightly higher for men (20.5% and 19.4% respectively)—despite the much larger percentage of female respondents. Notably, males were underrepresented in this study, constituting 6.6% of the total sample as compared with the national average of 9.6% (AIHW 2011c). Additionally, female nurses posted higher levels of perceived competence in relation to Foundational Knowledge and this challenges former research that suggests male nurses have a greater capacity to demonstrate this domain of competence (Fisher 2011). Plausibly, the empirical results of the current study challenge traditional gender-based perspectives.

In our study, nursing classification (RN, Educator or Manager) predicted overall perceived competence, including the three *'Social Interaction'* subscales (namely, Leadership, Collegiality and Empathy), and one

*'Experiential Knowledge* subscale, viz, Professional Development. One might anticipate that perioperative nurses holding positions as educators and managers would, understandably, perceive themselves as more competent in the domains of Leadership and Professional Development—a finding echoed in previous research (Meretoja et al 2004, Meretoja and Leino-Kilpi 2003, Kondrat 2001). However, of some concern is that nurses who identified as 'RN' reported lower levels of perceived competence in the domains of Leadership and Professional Development than their counterparts in education and management. To our knowledge, this is the first study to discern the unique contribution of these nursing classifications to specific domains of perioperative competence. Lower levels of perceived competence in this subsample of RNs may, in part, be attributed to the paucity of mentoring opportunities available to perioperative nurses practising at the coalface to develop their leadership skills as part of succession planning, a view described elsewhere (Gillespie et al 2011, Redman 2006). Implicitly, nurses working 'at the coalface' may either lack the opportunity or the motivation to participate in professional development activities such as hospital, vocational or university-based education programs.

Years of OR experience and specialty education were especially strong predictors of overall competence in our sample, and corroborates the litany of earlier work (Gillespie et al 2011, Grönroos and Perälä 2008, Meretoja et al 2004, Tzeng 2004, Santiano and Daffurn 2003). This study extends these understandings by disentangling potential confounding variables and specifically delineating domains of perioperative competence. In particular, years of OR experience predicted competence in Leadership, and in all of the three subscales- Foundational Knowledge, Proficiency, and Professional Development in the *'Experiential Knowledge'* domain. While specialty education was a powerful predictor of four of the six competence subscales, it did not contribute to the variability in the subscales of Empathy and Collegiality — a finding that is, seemingly, conceptually congruent.

**Study Limitations**

This study has several limitations. First, the cross-sectional survey design of this study does not allow the temporal order between predictors and outcomes to be determined; thus, causal relationships cannot be established. Second, the accessible population for this study was comprised of perioperative nurses who were members of ACORN. Conceivably, it is possible that selection bias occurred as a result of the inclusion of a specific subset of perioperative nurses that may not be representative of all nurses working in ORs across Australia. Previous research has shown significant statistical differences in relation to age, experience, and speciality qualifications in nurses who belong to a professional association, and those who do not (Gillespie et al 2010). However, respondents in this study practised in a variety of clinical settings including public and private facilities around the country. Thus using a professional association was the only feasible way of obtaining a national sample. Third, a response rate of around 35% is less than optimal, and responders may in some way be different to non-responders. Nevertheless, the sample size was sufficient to detect statistically significant results in multivariate analyses. Fourth, we measured nurses' perceived perioperative competence rather than their *actual* competence. That is, we did not perform structured observations to assess nurses' performance in the clinical environment. Yet, in spite of the criticism given to using self-report measures of competence (Brazen 2008, Watson et al 2002), such measures encourage reflective practice and should be used in conjunction with other forms of assessment. Finally, the survey results may have been influenced by other events that had occurred at the same time the survey was being completed. For instance, the possibility that some respondents had recently had either very positive or very negative experiences in the OR during the survey period. Therefore, 'history' may have contributed to the ways respondents answered the survey (Polit and Beck 2010).

### Implications for Recruitment and Workforce Planning

Quantifying competence in relation to a national demographic profile of perioperative nurses may inform future workforce planning policies. Beyond nursing numbers shrinking in size, the perioperative workforce, as with the other nursing specialties, will continue to grow older. Thus, efforts within the organisation to retain older nurses need to be centred on redesigning workplaces (e.g., flexible rostering, providing ergonomic environments), increased remuneration and professional recognition, and integrating technology to help with efficiency and safety (Oulton 2006, Bleich et al 2003, Cowin and Jacobsson 2003). Such strategies may increase nurse retention.

Clearly, for nurses to be deemed competent in high dependency areas such as the OR, specialty education and experience are paramount; their role has previously been confirmed as key structural variables that have the potential to affect patient outcomes (Doran et al 2006, Doran et al 2002). Saliently, as a consequence of the nursing shortage and changing models of care, some nursing work and roles have been devolved to other categories of healthcare staff. The result: an increasing trend to 'up-skill' lesser trained staff—not necessarily nurses (Gillespie et al 2009, Cowin and Jacobsson 2003). Possibly, this has the potential to erode staff skill mix. These results have indicated that RNs, who perform direct patient care, reported lower levels of perceived competence than other nursing classifications (manager, educator). From an organisational perspective, this signifies that workforce planning should include long-term strategies, such as creating academic partnerships with universities, to provide perioperative nurses (and other staff) access to specialty education and advanced skills programs. These programs could also be tailored to cater for new recruits, and thus provide staff development. Additionally, hospital -based mentorship programs as a means of succession planning and developing the 'next generation' of perioperative nurses will become crucial.

## CONCLUSIONS

Although this national survey only included perioperative nurses who were members of a professional association, it has provided valuable insights into the demographic profile and clinical roles undertaken by Australian perioperative nurses. Arguably, while some demographic characteristics may not be amenable to change, obtaining data will help to predict emerging trends in the workforce profile of perioperative nurses. Over the next decade, the demand for competent, highly skilled nurses is likely to outstrip supply. Clearly, there is a need to attract younger nurses into the perioperative specialty to replace an ageing workforce. However, it seems equally important to harness the talents, skills and abilities of older, more experienced perioperative nurses. As a means of addressing both of these situations, it is imperative to implement workforce planning initiatives in pre-registration education and post-basic training.

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