Having a greater proportion of registered nurses in a respiratory care centre is associated with fewer urinary infections and increased successful ventilator weaning.

Context
This study explored the impact of skill mix models on patient outcomes in a critical care environment. The registered nurse workforce, especially given predicted shortages, must take into account the evidence linking nursing and patient outcomes.

Research questions
1. Are specific skill mix models the most cost-effective model that supports quality care and take full advantage of the registered nurse workforce, especially given pre-dicted shortages?
2. Do the two most common underlying diseases, respiratory infections and urinary tract infections, also have a significantly higher rate of ventilator weaning in the 100% RN group?
3. Does a mixed RN and nursing aid model versus a 100% RN model decrease ventilator weaning, mortality, and urinary tract infection rates?

Methods
A longitudinal research undertook a retrospective analysis of patient and staff data from a medical centre in southern Taiwan over a 3-year period. The sample consisted of 487 patients who were admitted to the unit from 31 December 2006 to 31 December 2008. Demographic data was collected from hospital records. Patient outcome data was collected from the accounting office. Two time periods—1 January 2007 to 31 December 2007 and 1 January 2008 to 31 December 2008—were analysed, 247 patients from 1 July 2006 to 30 June 2007 (mixed RN model) and 240 patients from 1 January 2008 to 31 December 2008 (100% RN model). Nursing costs were used as an indirect measure of nursing hours. Data analysis utilised descriptive statistics for patient demographic data and the registered nurse workforce, especially given predicted shortages.

Findings
- There were no significant differences in the demographic characteristics of the two patient groups. Respiratory infections were the two most common underlying diseases.
- The two time periods (January to December 2007 and January to December 2008) were comparable. The hospital was staffed in both periods with a mixture of RNs and nursing aids.
- There were no significant differences in the occurrence of pressure ulcers, respiratory infections and blood stream infections, or mean length of stay. There were no statistically significant differences in the occurrence of pressure ulcers, respiratory infections and blood stream infections, or mean length of stay.
- The 100% RN group had significantly higher rates of respiratory infections, blood stream infections, and mortality compared to the mixed RN and nursing aid group.
- The 100% RN group also had a significantly higher rate of ventilator weaning.

Implications for practice and research
- Researchers must continue to investigate staffing models to determine the most cost-effective model that supports quality care and takes full advantage of the registered nurse workforce, especially given predicted shortages.
- The design would have been strengthened if methods were used to account for the impact of patient characteristics. In addition, the design was appropriate for the study purpose, but the sample size was too small to determine the monthly costs. Seasonal staffing changes on patient outcomes in a critical care environment must be taken into account. This evidence linking nursing and patient outcomes is crucial for policy makers and nurse leaders making staffing decisions.
variations therefore would not be captured, and may have masked possible relationships with the patient outcomes under examination.

The authors suggest that RNs might not follow standard infection control procedures and this may account for the higher bloodstream infection rate in the 100% RN group. This logic is difficult to follow, as this would be true of both staffing groups as the RN provide central venous catheters care in both. It is more likely, had adjustments for individual patient risk been undertaken, that this variance could have been explained.

Significant increases in successful weaning from ventilator care would contribute to improved patient outcomes which could provide a possible cost benefit to the medical centre. Further economic analysis in this regard would be informative.

Finally, determining the most appropriate nursing skill mix that maximises the benefit to patients, is cost-effective and utilises nursing resources wisely remains a challenge for nurse leaders, policy-makers and researchers. Whatever the best skill mix may be, there is a need to develop a framework that enables the RN to make safe delegation decisions while fully utilising supporting roles such as nursing aids.

Competing interests None.