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Feasibility of using payroll data to estimate hospital nurse staffing levels

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Feasibility of using payroll data to estimate hospital nurse staffing

Abstract

Introduction

The capacity for a hospital inpatient unit to provide high quality nursing care depends on a complex range of factors. Accurately identifying and measuring these factors is one of the challenges of nursing care quality research. Nursing hours per patient day and skill mix are two quantifiable indicators of capacity to provide nursing care.

Aims

The aims of the study are to measure fortnightly, unit-level nurse staffing and compare them to target nurse staffing levels.

Method

Nurse staffing and inpatient unit movement data were sourced for the administrative records of three Western Australian tertiary metropolitan hospitals (2004-2008). The impact of data source on nurse staffing estimates was tested with linear mixed models, adjusting for financial year. Counts, proportions, means, and standard deviations were used to describe nurse staffing data. Bar graphs depict proportion of nursing hours provided by nurses of different skill levels.

Results

Data source did not significantly affect estimate of nursing hours per patient day (p=0.788). Fortnights during which nurse staffing targets were not reached were recorded for all units. Skill mix varied between units with different staffing targets.

Conclusion

It is feasible to calculate fortnightly nursing hours and skill mix per hospital unit from raw nursing payroll and inpatient unit movement records. Fortnightly, unit-level measurement highlights nurse staffing fluctuations that are masked by annually aggregated data and are relevant for studies which investigate the
association between nurse staffing levels and inpatient complication rates. Staffing shortfalls may affect
nurses’ experiences of working or patients’ care experiences.

**Keywords**

Nurse staffing; Nursing hours per patient day; Skill mix
INTRODUCTION

Nurses provide 24 hour care to inpatients of hospital units as part of the health care team. There is evidence that patient health outcomes are directly influenced by the quality and quantity of nursing care provided on inpatient units (Kane, Shamiyan, Mueller, Duval, & Wilt, 2007; Subirana, Long, Greenhalgh, & Firth, 2014). Nursing hours per patient day and skill mix are two quantifiable indicators of capacity to provide nursing human resources. Currently these factors are not considered when providing and reflecting upon staffing requirements. Complex factors, both within and outside nurses’ control, interact to either enable or hinder their capacity to provide high quality care to patients (Griffiths, Jones, Maben, & Murrells, 2008; Needleman et al., 2011; Van den Heede, Clarke, Sermeus, Vleugels, & Aiken, 2007). Such factors include: appropriate numbers of skilled nurses with adequate experience and expertise; work environment; hospital commitment to inpatient safety; collaboration and communication between health professionals; and nurse burnout (Aiken & Patrician, 2000; Kane, et al., 2007; Lake, 2007; O’Brien Pallas & Hayes, 2008).

BACKGROUND

Skill mix and nursing hours per patient day (NHpPD) are two quantifiable nurse staffing indicators used as measures of capacity to provide nursing care (Griffiths, et al., 2008; Van den Heede, et al., 2007). The term ‘skill mix’ refers to the proportions of hours of nursing care that are delivered by nurses with different skill levels; for example, university educated Registered Nurses (RNs), or vocationally trained Enrolled Nurses (ENs, similar to Licensed Practical Nurses in North America). NHpPD is the number of hours of nursing care required to meet each patient’s care needs in a 24 hour period. The term NHpPD is used in two ways: by researchers to refer to a measure of nursing care (Van den Heede, et al., 2007), and by nurse managers to describe a method of planning appropriate future staffing levels (Twigg & Duffield, 2009).

Planning appropriate staffing levels for units is challenging and requires a flexible approach in order to respond to changeable patient care needs. Using usual patient profiles for each unit, the NHpPD method
takes into account multiple factors that impact on nurse workload to allocate units to categories which are then used to guide nurse staffing requirements (described in Table 1).

NHpPD are calculated by dividing productive hours worked by all nurses in a day by the number of patients on a unit in the same day. ‘Productive hours’ are those worked by nurses on specific inpatient units in direct patient care roles, and exclude hours during which education or leave occur. Specialist nurses (i.e. infection control nurse specialist) are not included here, though their productive hours contribute to patient care their responsibility is usually for a specific aspect of patient care. Productive hours by nurses delivering patient care are the recommended nurse staffing predictor of inpatient complications in statistical modelling (Park, Blegen, Spetz, Chapman, & De Groot, 2015).

Data sources for measuring nurse staffing

Accessing suitable data sources for measuring nursing care indicators like NHpPD and skill mix can be difficult when conducting nursing care quality research (Clarke & Donaldson, 2008). Nursing care quality research can require large datasets for statistical analysis and during the study period records of nursing hours per patient day and skill mix were not routinely collected at the fortnightly level and made widely available for research. Hospital nurse staffing levels are commonly measured using data sourced from two broad categories: firstly, prospective surveys of nurses about staffing levels and/or workload (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Duffield et al., 2011) and secondly, retrospective access to nurse staffing records (Blegen, Goode, & Reed, 1998; Needleman, et al., 2011; Twigg, Duffield, Bremner, Rapley, & Finn, 2011). Nurse staffing records include hospital data submitted to regulatory bodies (e.g. numbers and educational attainment of nurses employed at a particular facility), operational records obtained specifically for the purpose of a research project (e.g. nurse staffing rosters), or data used for other functions necessary for the running of the hospital (e.g. nursing payroll records). Data may be reported for individual units or may be aggregated and reported at the departmental or hospital level. Records do not always distinguish between nursing staff with direct patient care roles and those caring for outpatients, and may be recorded over varying time periods (e.g. daily, fortnightly, quarterly or annually).
(Blegen, 2006). Researchers can find that the calculation of the nurse staffing measure is dictated by data source access limitations, rather than the research question (Harless & Mark, 2006). Careful consideration of the limitations of different nurse staffing data sources is warranted since the measure of nurse staffing used has been found to affect the association between nurse staffing and inpatient complication rates (Brennan, Daly, & Jones, 2013; Jiang, Stocks, & Wong, 2006; Kane, et al., 2007; Spetz, Donaldson, Aydin, & Brown, 2008). For example, payroll data are a record of nurses who must be paid for turning up to work which may or may not match the hours of care that were required by inpatients during the same period. Though systems such as NHpPD aim to ensure the nurses who turn up to work do match changeable patient care needs.

**Using payroll data: outline and challenges**

Hospital nursing staff payroll records have been used in the international literature to construct measures of nurse staffing (Blegen, et al., 1998; Twigg, et al., 2011). Nurse staffing payroll records for public hospital employees in Western Australia (WA) are centrally housed at the Health Corporate Network, part of the Western Australian Department of Health (WADOH). However, because nursing payroll data are collected for fiscal rather than research purposes, potential limitations include: not capturing nurses who ‘float’ (i.e. are moved from their usual unit to work somewhere different for a shift) to different units without cost-recovery; not accounting for non-direct patient care activities such as nurses being off the unit for short education sessions; and payroll data may not be as carefully updated when changes do not affect payment (i.e. if a nurse moves unit but does not change pay rate, payroll data may not be updated in a timely manner).

**Western Australian context**

In 2002 the WA government applied the NHpPD staffing method to plan the amount of nursing time required to meet patient care needs, and this effectively mandated minimum staffing levels on units in all public hospitals (Twigg & Duffield, 2009). Specific hospital units were observed and allocated to specific NHpPD target categories using the method. Guiding characteristics considered before a unit is allocated to
a category include care complexity, turnover, and intervention levels (Error! Reference source not found.) (Twigg & Duffield, 2009). There are also specific NHpPD targets for units designated as tertiary, namely: Intensive Care Units (ICU, 31.5 hours), Coronary Care Units (CCU, 14.16 hours) or High Dependency Areas (HDA, 14.16 hours). Patients in category A units (Table 1), for example, typically have highly complex medical conditions and high intervention levels, and usually require 7.5 hours of nursing care each day of their hospitalisation.

**TABLE 1: NURSING HOURS PER PATIENT DAY GUIDING PRINCIPLES (TWIGG & DUFFIELD, 2009)**

Twigg, et al. (2011) investigated the impact of the introduction of the NHpPD method on inpatient complications. It was found that when the mandated NHpPD constituted an improvement in nurse staffing it was associated with a decreased incidence of several inpatient complications. However, this research did not specifically investigate whether mandated NHpPD matched actual nurse staffing levels (Twigg, et al., 2011). The WADOH reports target NHpPD for each unit compared to actual annual average NHpPD, but the comparisons are of aggregated averages which provide a much coarser estimate of attainment of NHpPD target staffing levels than is possible with fortnightly payroll and daily patient movement data (Government of Western Australia Department of Health, 2005, 2006, 2007, 2008).

The NHpPD method used in WA does not take into account the proportion of total nursing hours provided by RNs or any other indicator of skill mix despite skill mix having been recognised as an important indicator in the literature (Van den Heede, et al., 2007). Skill mix indicators such as proportion of hours provided by novice level nurses (Benner, 1982) and agency nursing staff could provide additional insight into the nursing care capacity of a unit.

**AIMS**

The aims of this study are threefold:

1) To validate fortnightly NHpPD calculations conducted using raw nursing payroll and inpatient unit movements data against annual figures released by the WADOH;
2) To explore the unit-level attainment rates of the NHpPD target staffing levels on a fortnightly, as opposed to an annual, basis; and
3) To explore whether nursing skill mix levels compensate when target NHpPD levels are not reached.

METHODS

The study sample comprised inpatient units at three tertiary metropolitan hospitals in WA from 1 July 2004 to 31 December 2008. Ethics approval was granted by the Human Research Ethics Committees of The University of WA (reference: RA/4/1/2469) and the WADOH (Project #2009/56).

Data sources

Hospital payroll and inpatient movement data were selected to examine their feasibility as sources to accurately measure fortnightly nurse staffing levels per hospital unit. The hospital payroll and inpatient unit movement data used to measure nurse staffing for this project were accessible for research purposes, did not incur charges, and offered the prospect of a complete, detailed, and precise staffing exposure per unit per fortnight for all hospital units included in the study sample. Alternative data sources were unsuitable for several reasons: the WA government only make publicly available annual average NHpPD per hospital unit and does not provide information about unit-level skill mix; implementing a prospective questionnaire method was not appropriate because comprehensive patient hospitalisation data was only available for a historical period (up to December 2008); and, the time and financial resources required to administer such a questionnaire to nurses in the study hospitals were outside the scope of the project.

Annually aggregated NHpPD levels reported by the WADOH do not show the fluctuations in staffing levels that could be seen if the data were reported divided into shorter time periods. Therefore, fortnightly nursing payroll records and inpatient unit movement data were accessed so that more detailed nurse staffing measures could be calculated. Because raw data were manipulated to calculate the study’s fortnightly staffing measures, the results were validated against annually aggregated NHpPD levels reported by the WADOH.
Data on hours of nursing care were sourced from nursing payroll records held by the Health Corporate Network, a branch of the WADOH. Hours were averaged over fortnightly pay periods and only productive hours were included (i.e. only hours spent in direct patient care). Hours worked by nurses in administrative, management and education roles, and hours paid for by Health Corporate Network during which direct patient care was not undertaken by the nurse were excluded, such as sick leave, workers compensation, and annual and study leave. Supernumerary shifts were indistinguishable in the payroll data as were education sessions not classified as study leave. The payroll data were recorded in fortnightly pay periods per nurse, which were aggregated to inpatient unit groups.

Data on days of inpatient care were sourced from hospital patient administrative information management systems. All inpatient days per unit were included; patient leave days were excluded. Time spent off unit while an inpatient was indistinguishable in the patient administration management system data (e.g. when a patient went to imaging for 2 hours during the day). Fortnights of unit data were excluded if there was not corresponding information in both the unit movement and nurse staffing files for that fortnight.

**Data cleaning**

After preliminary data cleaning, the separate nurse staffing and inpatient unit movement files were linked by matching on two variables: unit name and time period. This process was not straightforward because the variables describing these characteristics were different in the two sources. The payroll data identified units by cost centre descriptions and the unit movement data used different codes from the inpatient information management software.

The accuracy of the matching process was central to creating a meaningful measure of nurse staffing. In the context of these challenges, careful deliberation was undertaken prior to finalising each matching decision. Probable associations were identified and confirmed by nurse managers who were familiar with the cost centre descriptions in the payroll data and the codes used by the inpatient information management software. The nurse managers also confirmed that nurses working on different units were paid for by separate cost centres and nurses in direct patient care roles were paid from different cost
centres to those in management and education roles. When nurses ‘float’, their costs would usually be recouped through a process resulting in all worked hours appearing next to the cost centre corresponding to where the care was provided, regardless of where the nurse usually worked.

Data validation
Analyses were performed using IBM SPSS (Version 21, IBM SPSS Inc. 2010, Chicago, Il, www.spss.com). To establish their validity, the fortnightly NHpPD estimates calculated using the nursing payroll and inpatient unit movement data were compared to those published in WADOH NHpPD Annual Reports. The WADOH produced five NHpPD Annual Reports during the study period which listed the target staffing category and the mean NHpPD for each inpatient unit (Government of Western Australia Department of Health, 2005, 2006, 2007, 2008). Linear mixed models were used to test the impact of data source on estimated mean NHpPD, adjusting for financial year. The significance level was p=0.05 and repeated measurements within each hospital and unit category were accounted for by applying an unstructured covariance structure.

Descriptive analysis
For each unit category, counts, proportions, means, and standard deviations were used to describe NHpPD and related data. Graphical representations show the proportions of NHpPD provided by RNs, beginner-level nurses, and agency nurses. Beginner-level nurses included ENs and RNs with less than two years of post-university working experience (Benner, 1982).

RESULTS
The validation analysis found no significant difference between the mean NHpPD estimated using nursing payroll and inpatient unit movement data and the means reported by the WADOH (p=0.788). There was considerable fluctuation in fortnightly-calculated NHpPD which was masked when NHpPD was reported annually. Unit category was a significant factor in the mixed model, indicating that units with different target category classifications did have statistically significant differences in NHpPD (p=0.012). There was no significant difference in NHpPD between hospitals (p=0.452).
Mean versus target NHpPD per unit category are summarised in Table 2. The average census levels in ICU and CCU/HDA were 13 and 11 patients respectively; the other categories had average census levels between 23 and 26 patients (Table 2, column 5). Overall, units in higher NHpPD target categories met their targets less frequently than units with lower targets, but units in all categories had a proportion of fortights during which staffing was below target (Table 2, column 7). CCU/HDA and A category units were 11% below NHpPD target levels 58% and 49% of the time respectively. ICU and C category units were approximately 7% below NHpPD target levels 22% and 16% of the time respectively. Approximately 17% of the time, B category units were 5.5% below target. B+ and D category units did not fall short of target by more than 4% on average.

**TABLE 2: NHPPD SUMMARIES PER UNIT CATEGORY**

Figures 1, 2, and 3 compare the skill mix levels in each unit category when NHpPD targets are met and when they are not met. Measures of skill mix were greater in unit categories with the highest NHpPD targets; a higher proportion of hours of care were provided by RNs (Figure 1) and a lower proportion by beginners (Figure 2). When NHpPD was below target, a greater proportion of hours of care were provided by RNs (Figure 1, all except category D) and beginners (Figure 2, all except ICU). Across all categories, the proportion of NHpPD provided by agency staff was lower on fortights when targets were not met (Figure 3).

**FIGURE 1: PROPORTION OF NHPPD PROVIDED BY RNS ON FORTNIGHTS BELOW CATEGORY TARGET VS THOSE AT OR ABOVE TARGET**

**FIGURE 2: PROPORTION OF NHPPD PROVIDED BY BEGINNERS ON FORTNIGHTS BELOW CATEGORY TARGET VS THOSE AT OR ABOVE TARGET**

**FIGURE 3: PROPORTION OF NHPPD PROVIDED BY AGENCY STAFF ON FORTNIGHTS BELOW CATEGORY TARGET VS THOSE AT OR ABOVE TARGET**

**DISCUSSION**

This study showed that estimates of NHpPD calculated using raw payroll and inpatient unit movement data were not significantly different from those documented in the WADOH NHpPD Annual Reports.
Calculating NHpPD from raw data offered two benefits over using the government reported estimates. Firstly, compared to annual aggregates, fortnightly estimates of units’ NHpPD are more detailed and capture varying trends in staffing levels over time. Secondly, the variables recorded in nursing payroll data enable measurement of skill mix, a variable not included in the WADOH reports. The validation analysis provided evidence that the data cleaning and file manipulation independently undertaken for this research resulted in more detailed yet analogous NHpPD estimates compared with the WADOH values.

Overall, units in higher NHpPD categories experienced below target staffing levels more often than units with lower targets (see Table 2). Patient exposure to shortfalls in nurse staffing levels during an inpatient stay has been associated with increased risk of death (Needleman, et al., 2011) and nursing sensitive inpatient complications (Twigg, Gelder, & Myers, 2015). Before judgements can be made about the seriousness of these shortfalls, the specific context should be considered. It may be unrealistic for staffing levels to never fall below the target levels. The circumstances around which the hours are not met should be taken into consideration, especially since the NHpPD staffing method does not include consideration of skill mix. When NHpPD targets were not reached, skill mix was greater in some regards (i.e. greater proportion of NHpPD provided by RNs, Figure 1) but not in others (i.e. greater proportion of NHpPD provided by beginners, Figure 2). Even though there were more RNs, they had less experience so it is difficult to infer whether skill mix characteristics made up for the NHpPD shortfall on the unit at the time.

In certain circumstances, it may have been appropriate that below NHpPD target staffing levels were not acted upon. The shortfalls could have been demand based and a result of nurse managers adjusting staffing appropriately in response to temporary decreases in patient acuity or improvements in nurse staffing skill mix. The results present a mixed view of whether skill mix was better when staffing hours were below target depending on the measure used. Defined as the proportion of nursing hours provided by RNs, skill mix is better; RNs provided a higher proportion of NHpPD in all unit categories except D when staffing targets were not met (Figure 1). Conversely, when defined as the proportion of nursing hours provided by...
beginner level nurses, skill mix was worse; when staffing targets were not met, beginners provided a higher proportion of NHpPD in all unit categories except ICU (Figure 2). The data collected for this study do not enable us to deduce the magnitude of effect these skill mix differences would have when NHpPD are below target.

If staffing does not fall far enough below the target parameters to warrant adding an additional staff member, below target staffing levels may not be acted upon. Though there are thresholds for adding an additional staff member when staffing falls short of a unit’s NHpPD target, they do not take skill mix into account; a factor that would potentially be taken into consideration by the nurse manager making staffing decisions. Needleman et al., (2011) measured shift-by-shift nurse staffing and flagged when staffing was 8 hours or more below target. Staffing levels that fall short of target levels have been associated with increased likelihood of experiencing inpatient complications (Needleman, et al., 2011; Twigg, et al., 2015).

Arguably, nurses’ experiences of working on units and patients’ experiences of being cared for may be noticeably affected even if staffing levels fall short of targets by fewer than 8 hours. To illustrate this point, consider units in category A, which are on average 0.85 NHpPD below NHpPD target on approximately half of the fortnights during the study period (Table 2, row 4, columns 7 and 8). This amount of NHpPD equates to 51 minutes of patient care time forgone by patients who have been assessed as requiring 7.5 hours of nursing care per day. What amount of nursing care would a nurse usually achieve in this time and what care is forfeited? Could more highly skilled nurses (i.e. maybe those with more experience or education) make better decisions about what care to prioritise OR could they have more advanced time management skills, enabling them to leave fewer tasks not completed compared with nurses who have lower skill levels? Further research is warranted to explore how nurses make decisions about prioritising care when staffing falls below adequate levels.

Below target NHpPD becomes problematic when supply-based shortfalls mean that staffing cannot be maintained at the target level. This study indicates that agency staff were relied upon to achieve target
staffing levels, since higher proportions of nursing hours were provided by agency staff when NHpPD targets were met or exceeded (Figure 3). But agency staff were not always available to ensure target staffing levels were reached. A lower proportion of NHpPD provided by agency staff when targets were not met may have been because there were insufficient agency staff available at these times.

Limitations
There are a number of limitations to this study. Firstly, the skill mix measures selected were constrained by the availability of administrative data and potentially subject to the recording errors associated with using routinely recorded data. Secondly, factors other than skill mix and hours of nursing care impact on a unit’s nursing care capacity, but this information is not recorded in administrative data sources and measuring other factors was not within the scope of the study. Thirdly, payroll data does not capture circumstances where nurses are absent from the unit if that absence does not require cost-recovery or if cost-recovery is not done for some reason. Fourthly, the NHpPD method implicitly assumes that care requirements of patients on a unit are homogenous; while this is unlikely it was not within the scope of this project to explore how this is dealt with in practice. Finally, although WADOH reported NHpPD levels were the most feasible comparator for the validation analysis, other comparators may have provided a more rigorous validation baseline.

CONCLUSION
Presenting fortnightly, unit-level measurement of NHpPD highlights the considerable variation in staffing levels that is masked in annually aggregated reports. It is feasible to calculate fortnightly NHpPD and skill mix per hospital unit from raw nursing payroll and inpatient unit movement records and this would provide more detail for decision-making about best nurse staffing levels for optimal patient care. In this study, there was wide variation between NHpPD target categories in the proportion of fortnights that did not reach target NHpPD levels, even though the degree of shortfall did not frequently reach a threshold that would result in allocation of an additional staff member. However, even if a pre-determined threshold
was not reached, the staffing shortfall may have affected nurses’ experiences of working or patients’ experiences of being cared for at these times.

REFERENCES


FIGURE 1: PROPORTION OF NHpPD PROVIDED BY RNS ON FORTNIGHTS BELOW CATEGORY TARGET VS THOSE AT OR ABOVE TARGET

![Bar Chart: Comparison of NHpPD provided by RNS on Fortnights Below Category Target vs Those at or Above Target](chart.png)

- **Below target NHpPD**
- **At or above target NHpPD**
FIGURE 2: PROPORTION OF NHpPD PROVIDED BY BEGINNERS ON FORTNIGHTS BELOW CATEGORY TARGET VS THOSE AT OR ABOVE TARGET

![Bar chart showing proportion of NHpPD provided by beginners on fortights below category target vs those at or above target. The x-axis represents NHpPD target categories (ICU, CCU/LIDA, A, B+, B, C, D), and the y-axis represents the proportion ranging from 0 to 1. The bars are shaded in dark gray for "Below target NHpPD" and light gray for "At or above target NHpPD." Each target category shows a varying proportion of NHpPD provided by beginners.]
FIGURE 3: PROPORTION OF NHPPD PROVIDED BY AGENCY STAFF ON FORTNIGHTS BELOW CATEGORY TARGET VS THOSE AT OR ABOVE TARGET
<table>
<thead>
<tr>
<th>Unit category</th>
<th>NHpPD</th>
<th>Criteria for measuring diversity, complexity and nursing tasks required</th>
</tr>
</thead>
</table>
| A             | 7.5   | High complexity  
High dependency unit (6 beds within a unit)  
Tertiary step down Intensive Care Unit  
High intervention level  
Specialist unit, tertiary level 1:2 staffing |
| B             | 6.0   | High complexity  
No high dependency unit  
Tertiary step down Coronary or Intensive Care Unit  
Moderate to high intervention level  
Special unit including Mental Health Unit  
High patient turnover ≥50% |
| C             | 5.75  | High complexity  
Acute care unit  
Moderate patient turnover >35% OR Emergency patient admissions >50% |
| D             | 5.0   | Moderate complexity  
Acute rehabilitation secondary level  
Acute care unit  
Moderate patient turnover >35% OR Emergency patients admissions >40% |

1Turnover is defined as the number of admissions, transfers and discharges divided by bed number.
## TABLE 2: NHPPD SUMMARIES PER UNIT CATEGORY

<table>
<thead>
<tr>
<th>NHpPD(^1) category</th>
<th>Target NHpPD</th>
<th>Units</th>
<th>Fortnights with valid data(^2)</th>
<th>Mean number of patients per unit</th>
<th>Mean NHpPD (SD)</th>
<th>Proportion of fortnights below target</th>
<th>Mean NHpPD below target (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU(^3)</td>
<td>31.5</td>
<td>3</td>
<td>343</td>
<td>13</td>
<td>34.2 (4.03)</td>
<td>0.22</td>
<td>-2.11 (1.62)</td>
</tr>
<tr>
<td>CCU(^4)/HDA(^5)</td>
<td>14.16</td>
<td>4</td>
<td>356</td>
<td>11</td>
<td>13.7 (2.01)</td>
<td>0.58</td>
<td>-1.52 (0.96)</td>
</tr>
<tr>
<td>A</td>
<td>7.5</td>
<td>8</td>
<td>847</td>
<td>23</td>
<td>7.6 (1.21)</td>
<td>0.49</td>
<td>-0.85 (0.62)</td>
</tr>
<tr>
<td>B+</td>
<td>6.5</td>
<td>2</td>
<td>127</td>
<td>25</td>
<td>7.9 (1.00)</td>
<td>0.08</td>
<td>-0.12 (0.07)</td>
</tr>
<tr>
<td>B</td>
<td>6.0</td>
<td>25</td>
<td>1,963</td>
<td>24</td>
<td>6.8 (1.03)</td>
<td>0.17</td>
<td>-0.33 (0.39)</td>
</tr>
<tr>
<td>C</td>
<td>5.75</td>
<td>16</td>
<td>1,253</td>
<td>24</td>
<td>6.5 (1.01)</td>
<td>0.16</td>
<td>-0.38 (0.49)</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
<td>4</td>
<td>228</td>
<td>26</td>
<td>6.0 (0.77)</td>
<td>0.13</td>
<td>-0.22 (0.13)</td>
</tr>
</tbody>
</table>

\(^1\) Nursing Hours per Patient Day  
\(^2\) Number of fortnights per unit ranged from 8 to 128  
\(^3\) Intensive Care Unit  
\(^4\) Coronary Care Unit  
\(^5\) High Dependency Area