



## Nurse work environment and quality of care by unit types: A cross-sectional study



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### ARTICLE INFO

#### Article history:

Received 3 November 2014

Received in revised form 27 May 2015

Accepted 29 May 2015

#### Keywords:

Quality of care

Work environment

Nursing

Health care

### ABSTRACT

**Background:** Nursing unit is the micro-organization in the hospital health care system in which integrated patient care is provided. Nursing units of different types serve patients with distinct care goals, clinical tasks, and social structures and norms. However, empirical evidence is sparse on unit type differences in quality of care and its relation with nurse work environment. Nurse work environment has been found as an important nursing factor predicting nurse and patient outcomes.

**Objectives:** To examine the unit type differences in nurse-reported quality of care, and to identify the association between unit work environment and quality of care by unit types.

**Methods:** This is a cross-sectional study using nurse survey data (2012) from US hospitals nationwide. The nurse survey collected data on quality of care, nurse work environment, and other work related information from staff nurses working in units of various types. Unit types were systematically classified across hospitals. The unit of analysis was the nursing unit, and the final sample included 7677 units of 14 unit types from 577 hospitals in 49 states in the US. Multilevel regressions were used to assess the relationship between nurse work environment and quality of care across and by unit types.

**Results:** On average, units had 58% of the nurses reporting excellent quality of care and 40% of the nurses reporting improved quality of care over the past year. Unit quality of care varied by unit types, from 43% of the nurses in adult medical units to 73% of the nurses in interventional units rating overall quality of care on unit as excellent, and from 35% of the nurses in adult critical care units to 44% of the nurses in adult medical units and medical-surgical combined units reporting improved quality of care. Estimates from regressions indicated that better unit work environments were associated with higher quality of care when controlling various hospital and unit covariates; and this association persisted among units of different types.

**Conclusions:** Unit type differences exist in the overall quality of care as well as achievement in improving quality of care. The low rates of nurses reporting improvement in the quality of nursing care to patients suggest that further interventions focusing at the unit-level are needed for achieving high care quality. Findings from our study also suggest that improving nurse work environments can be an effective strategy to improve quality of care.

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### What is already known about the topic?

- Nursing unit is the micro-organization in the hospital health care system; and units of different types varied in patient care goals, clinical tasks, role expectations, and social structures and norms.

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- Most studies of quality of care and work environment have been conducted at hospital level.
- In the studies that examined quality of care and work environment at the unit-level, unit type differences were rarely investigated.

### What this paper adds

- Quality of care varies significantly across unit types in US hospitals.
- Despite tremendous effort, improvement in quality of care has not been as good as expected as suggested by our finding of low percentage of nurses reporting improvement in quality of care to patients.
- Quality of unit work environments is associated with quality of care and this association persists across nursing units with different patient population and care objectives.

## 1. Introduction

Quality of patient care is a concern in the U.S. and many other countries (IOM, 2000, 2001; WHO, 2003). One commonly perceived challenge in improving quality of care is measuring health care quality. Nursing is widely recognized as a major contributor to superior quality of patient care. The nursing workforce is the largest group of health care providers in developed countries and many developing countries (HRSA, accessed on July 15, 2014; WHO, accessed on February 3, 2015). Nurses provide round-the-clock bedside care and spend more time with patients than any other health care professionals. Consequently, nurses are frequently referred to as reliable and valid informants of quality of care. Empirical evidence has shown that nurse-reported quality of care is an indicator of hospital performance comparable to objective indicators of quality such as mortality and failure-to-rescue (McHugh and Stimpfel, 2012).

To date, a body of literature has examined quality of care using nurse reports (Aiken et al., 2013; Griffiths et al., 2014; Rochefort and Clarke, 2010; Stimpfel and Aiken, 2013; Van Bogaert et al., 2013a); however, in the majority of these studies, nurses' reports on quality of care were either examined at individual-level or aggregated to hospital level. A relatively small number of studies have focused quality of care at the unit level; and among them, the vast majority were in medical and surgical units (Liu et al., 2012; Rochefort and Clarke, 2010; Van Bogaert et al., 2013b,c). Little is known about the quality of care among units of other types. Unit types represent distinct patient care goals, clinical tasks, role expectations, and social structures and norms; and literature has documented unit type differences in nurse work environments (Choi and Boyle, 2014), specialty certification rates (Boyle et al., 2012), and nurse outcomes (Ingersoll et al., 2002). Therefore, a study examining differences in quality of care by unit types will have major implications for the delivery of quality care.

Quality of care is subject to the influence of organizational factors, of which the nurse work environment is a critical one. The nurse work environment is multifaceted

and consists of a set of modifiable organizational characteristics that facilitate or constrain professional nursing practice (Lake, 2002). Despite a large body of literature documenting the impact of the nurse work environment on nurse outcomes and quality of care in the United States (Aiken et al., 2008; McHugh and Ma, 2014), Canada (Spence Laschinger and Leiter, 2006), Australia (Roche et al., 2011), European countries (Hinnno et al., 2011), and Asian countries (Aiken et al., 2011; Nantsupawat et al., 2011; Zhang et al., 2013), often the nurse work environment was operationalized as a hospital-level factor. Still recently, there is an emerging body of evidence linking the work environment to quality of care at the unit level (Kirwan et al., 2013; Van Bogaert et al., 2010, 2013a,b,c). However, these studies often have some methodological issues in studying unit type differences, including small samples of units, limited number of unit types, and inconsistent classification of unit types across hospitals. Therefore it is unclear whether the effect of nurse work environment on quality of care persists across unit types, in particular those unit types that have been rarely studied such as emergency department, peri-operative, and psychiatric units.

We had an opportunity to fill this knowledge gap by using large-scale unit-level data from the National Database of Nursing Quality Indicators<sup>®</sup> (NDNQI<sup>®</sup>). NDNQI was founded in 1998 by the American Nursing Association (ANA) with the mission of aiding nurses in efforts of improving care quality and patient safety (Montalvo, 2007). It is a national nursing quality measurement data repository in the US that enables researchers to compare quality of hospital nursing and nursing-sensitive patient outcomes at the unit level. In the NDNQI database, units from different hospitals nationwide were systematically classified into a defined unit type based on patient population, type of care provided, and acuity level.

In this study, we aim to advance the understanding of the impact of nurse work environment on quality of care. The purpose of this study was two-fold: to provide new information on quality of patient care in various unit settings (14 unit types) using large-scale nurse reports; and to estimate the extent to which nurse reported quality of care was associated with work environments among units of different types.

## 2. Methods

This is a cross-sectional study using secondary data from the 2012 NDNQI Registered Nurse (RN) Survey with the Practice Environment Scales (PES). The 2012 nurse survey data was the newest data of this kind available when we initiated this project.

### 2.1. Data and sample

Aiming to assess, understand, and improve the nursing work environment, about a decade ago, the NDNQI initiated an annual web-based RN Survey to collect information of nurse work environment, job satisfaction, work load, and demographics directly from nurses employed in participating units from member hospitals. In this study, selected items related to measures of unit

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