

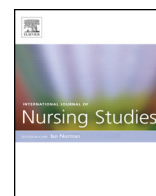


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The relationship between patient safety culture and adverse events: A questionnaire survey

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ABSTRACT

Background: Patient safety culture is an important factor in the effort to reduce adverse events in the hospital and improve patient safety. A few studies have shown the relationship between patient safety culture and adverse events, yet no such research has been reported in China.

Objectives: This study aimed to describe nurses' perception of patient safety culture and frequencies of adverse events, and examine the relationship between them.

Design: This study was a descriptive, correlated study.

Setting and participants: We selected 28 inpatient units and emergency departments in 7 level-3 general hospitals from 5 districts in Guangzhou, China, and we surveyed 463 nurses.

Methods: The Hospital Survey on Patient Safety Culture was used to measure nurses' perception of patient safety culture, and the frequencies of adverse events which happened frequently in hospital were estimated by nurses. We used multiple logistic regression models to examine the relationship between patient safety culture scores and estimated frequencies of each type of adverse event.

Results: The Positive Response Rates of 12 dimensions of the Hospital Survey on Patient Safety Culture varied from 23.6% to 89.7%. There were 47.8–75.6% nurses who estimated that these adverse events had happened in the past year. After controlling for all nurse related factors, a higher mean score of "Organizational Learning-Continuous Improvement" was significantly related to lower the occurrence of pressure ulcers (OR = 0.249), prolonged physical restraint (OR = 0.406), and complaints (OR = 0.369); a higher mean score of "Frequency of Event Reporting" was significantly related to lower the occurrence of medicine errors (OR = 0.699) and pressure ulcers (OR = 0.639).

Conclusions: The results confirmed the hypothesis that an improvement in patient safety culture was related to a decrease in the occurrence of adverse events.

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What is already known about the topic?

- Theoretically, patient safety culture (PSC) is regarded as an important factor in the prevention of adverse events (AEs) in healthcare settings, but the relationship lacks quantitative evidence.
- Few studies have examined the relationship between PSC and AEs.
- Although some studies have investigated the rates of some AEs and nurses' perception of PSC, no study had examined the relationship between them in Chinese hospitals.

What this paper adds

- Nurses' perception of PSC was not satisfactory and the nurse-estimated AEs were high in Chinese hospitals.
- Improvement in nurses' perception of PSC was related to a decrease in the occurrence of patient AEs.

1. Introduction

1.1. Background

The Institute of Medicine (IOM) emphasized that it was important for healthcare organizations to establish a safety culture to ensure that patients were not inadvertently harmed by errors in the care which was supposed to heal them (Steffl, 2001). PSC in healthcare organizations, specifically hospitals, includes communication founded on mutual trust, good information flow, shared perception of the importance of safety, organizational learning, commitment from management and leadership, and the presence of a non-punitive approach to incident and error reporting (Sanders and Cook, 2007). AEs have become a global problem; they are an important indicator of patient safety (Baker et al., 2004). The IOM pointed out that preventable AEs happen not only due to individual factors such as inadequate skills or knowledge of nurses or doctors; it claimed that system errors due to problems in areas such as management, work environment and staffing are a more important aspect of preventable AEs (Steffl, 2001). It is therefore urgent to build a safety system, and building a safety culture is the first step towards it (Maurette, 2002).

There are several methods of collection of AEs data, such as reviews of medical or nursing records, direct observation, reporting systems, nurses' estimates, patient interviews and so on (Cina-Tschumi et al., 2009; Flynn et al., 2002; Olsen et al., 2007). Each method has its strengths and weaknesses. For example, a review of medical or nursing records and direct observation can provide accurate information of antecedents and outcomes of AEs, but implementing it may cost more time and staffing (Flynn et al., 2002). A reporting system is an accepted useful method to collect information about AEs, but the high missed report rate is its weakness (Grenier-Sennelier et al., 2002). Many hospitals have a reporting system, but most of them do not work well in China (Dai et al., 2009). Nurses' estimates can not only collect mass of data in a short amount of time with little money and staffing, but also collect more accurate information

without fear of punishment (Stratton et al., 2004). Although this method of data collection may be subject to respondent bias and recall bias (Manojlovich and DeCicco, 2007), Cina-Tschumi et al. (2009) showed that nurses' estimated "patient fall" frequencies over the period of one year were concordant with continuously and systematically assessed data and more accurate than the latter over one month. This method has showed usefulness in other studies (Aiken et al., 2001; Sochalski, 2004). For these reasons, we have chosen to use nurses' estimates to collect data about the frequencies of AEs over a period of one year.

It has been suggested that establishing a good safety culture can help prevent an error chain from causing a real error (Reason, 1995), but the relationship between PSC and AEs lacks quantitative evidence. Some researches (Hansen et al., 2011; Singer et al., 2009; Zohar et al., 2007) found that PSC was negatively correlated with some AEs (medicine error, acute myocardial infarction, heart failure or Patient Safety Indicators which monitored AEs). Another study (Ausserhofer et al., 2012) found that none of the AEs it looked at (medication administration error, pressure ulcer, patient fall, urinary tract infection, bloodstream infection and pneumonia) was significantly correlated with PSC, while rationing of nursing care was significantly correlated with patient satisfaction, medicine errors, bloodstream infection and pneumonia; this indicated that nurse-related organizational factors may have affected AEs. Studies that examined the relationship between PSC and a single type of AE employed controls for nurse-related factors such as staffing ratio and education (Hansen et al., 2011; Vogus and Sutcliffe, 2007). We deduced from this that for our examination of the relationship between PSC and AEs, we would need to take account of nurse-related factors.

To our knowledge, a few researches have been conducted to explore the relationship between PSC and AEs, yet none examined the relationship between PSC and AEs in China.

1.2. Objectives

The objectives of this study were to describe nurses' perception of PSC and their estimate of the frequencies of AEs and to examine the relationship between PSC and AEs in Chinese hospitals.

2. Methods

2.1. Design

This study was a descriptive, correlated study.

2.2. Sample and setting

Eight out of Guangzhou's twelve districts are described as main urban areas due to high population density. Based on stratified sampling, we sampled seven level-3 hospitals (the large, high-tech hospitals with 1000–2500 beds) in five main urban areas of Guangzhou, covering 1 in 3 of Guangzhou's total count of level-3 hospitals and 5 in

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