Effort-Reward Imbalance, Task Performance, and Contextual Performance of Nurses in Tertiary Hospitals, Chengdu City, Sichuan Province, the People's Republic of China*

การไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับ การปฏิบัติงานตามลักษณะงาน และการปฏิบัติงานตามสถานการณ์ของพยาบาลในโรงพยาบาลตติยภูมิ เมืองเฉิงตู มณฑลเสฉวน สาธารณรัฐประชาชนจีน*

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Abstract

Job performance is important for nurses in providing care to patients. This descriptive correlational study aimed to explore effort- reward imbalance, task performance, and contextual performance, and to examine the relationship between effort-reward imbalance and task and contextual performance among nurses in tertiary hospitals in Chengdu City, Sichuan province, the People's Republic of China. The participants included 329 nurses working in tertiary hospitals, selected using a stratified random sampling method. The research instruments included the effort-reward imbalance scale developed by Siegrist et al. and the nursing performance scale developed by Greenslade. The reliabilities of both scales were tested, and Cronbach's alpha coefficients were 0.72 for effort and 0.83 for reward. The Cronbach's alpha coefficients for the nursing performance scale were 0.86 for task performance and 0.84 for contextual performance. Data were analyzed by using descriptive statistics and Pearson's product-moment correlation coefficient.

The results showed that 43.77% of nurses perceived effort-reward imbalance. Nurses perceived task and contextual performance at a moderate level (Mean = 53.73, SD = 11.03; Mean = 63.92, SD = 12.78, respectively). It was found that there was a statistically significant weak negative relationship between effort-reward imbalance and task performance ($r = -.14$, $p < .01$) and contextual performance ($r = -.17$, $p < .01$).

Nurse administrators should decrease effort- reward imbalance to enhance job performance.

Keywords: Effort-reward imbalance; Job performance; Nurse; Tertiary hospital

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Received 1 June 2024; Revised 9 September 2024; Accepted 19 September 2024

บทคัดย่อ

การปฏิบัติงานของพยาบาลมีความสำคัญต่อการดูแลผู้ป่วย การศึกษาเชิงพรรณนาหาความสัมพันธ์ครั้งนี้มีวัตถุประสงค์เพื่อศึกษาการไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับ การปฏิบัติงานตามลักษณะงานและตามสถานการณ์ และเพื่อศึกษาความสัมพันธ์ระหว่างการไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับ และการปฏิบัติงานตามลักษณะงานและตามสถานการณ์ของพยาบาลในโรงพยาบาลตติยภูมิ เมืองเฉิงตู มณฑลเสฉวน สาธารณรัฐประชาชนจีน กลุ่มตัวอย่าง คือพยาบาลจำนวน 329 คน ที่ปฏิบัติงานอยู่ในโรงพยาบาลตติยภูมิที่คัดเลือกโดยใช้การสุ่มแบบชั้นภูมิ เครื่องมือวิจัย คือ แบบวัดการไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับที่พัฒนาโดย ซีกริสท์ และคณะ และแบบวัดการปฏิบัติงานที่พัฒนาโดย กรีนสเลด แบบวัดทั้งสองผ่านการตรวจสอบความเชื่อมั่น โดยมีค่า Cronbach's alpha coefficient ของแบบวัดความพยายาม เท่ากับ 0.72 ของแบบวัดรางวัล เท่ากับ 0.83 และมีค่า Cronbach's alpha coefficient ของแบบวัดการปฏิบัติงานตามลักษณะงาน เท่ากับ 0.86 ของแบบวัดการปฏิบัติงานตามสถานการณ์เท่ากับ 0.84 วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและสถิติ Pearson's product-moment correlation coefficient

ผลการศึกษาครั้งนี้พบว่า พยาบาลร้อยละ 43.77 รับรู้การไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับ พยาบาลรับรู้การปฏิบัติงานตามลักษณะงานและการปฏิบัติงานตามสถานการณ์ในระดับระดับปานกลาง (Mean = 53.73, SD = 11.03; Mean = 63.92, SD = 12.78 ตามลำดับ) และพบว่าการไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับมีความสัมพันธ์เชิงลบระดับต่ำอย่างมีนัยสำคัญทางสถิติกับการปฏิบัติงานตามลักษณะงาน ($r = -.14$, $p < .01$) และการปฏิบัติงานตามสถานการณ์ ($r = -.17$, $p < .01$)

ผู้บริหารทางการพยาบาล ควรลดความไม่สมดุลระหว่างความพยายามกับรางวัลที่ได้รับเพื่อเพิ่มการปฏิบัติงานให้มากขึ้น

คำสำคัญ: การไม่สมดุลระหว่างรางวัลและความพยายามที่ได้รับ การปฏิบัติงาน พยาบาล โรงพยาบาลตติยภูมิ

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Background and significance

As the center of the health system, the hospital plays a crucial role in patient safety and reform (McKee & Healy, 2002). Nonetheless, many obstacles confront hospitals nowadays, such as emerging illness patterns, quickly changing medical technologies, aging populations, and ongoing financial limitations. Also, needs and satisfaction are considered for improving health and quality of service since patients are more likely to keep using healthcare services when they are happy with their care (Hill & Doddato, 2002). All changes in the healthcare system and customer satisfaction require a nurse to have high job performance (Simorangkir et al., 2021).

Job performance is defined as behaviors performed by nurses that directly contribute to the technical foundation of the hospital and maintain the broader social environment in which the technical core must function (Greenslade, 2008). It includes two subdimensions: task performance and contextual performance. Task performance refers to those behaviors that are the core responsibility of being a nurse. Contextual performance refers to actions that support the hospital's social, psychological, or organizational environment. To improve job performance, factors that affect job performance should be considered.

According to social reciprocity principles, it is the expectation that a costly transaction provided by one person will be returned in some form (Siegrist, 2012). Effort and reward imbalance is under the social reciprocity principles which show the expectations of a person in an organization (Siegrist, 2016). When nurses perceive efforts and gains imbalances, negative emotions and bodily stress reactions result in long-term consequences for health and well-being (Cooper & Quick, 2017). Employees who work under pressure and in stressful conditions may experience low-performance levels that can impact organizational outcomes (Babic et al., 2020). Therefore, effort rewards imbalance is a significant factor in job performance, as it influences both the motivation and well-being of nurses, ultimately affecting their overall job effectiveness.

The effort-reward imbalance (ERI) is described as a failed reciprocity between the effort spent at work, such as the pace of work, workload, or time spent, and the rewards received in turn, which can bring stress (Siegrist et al., 2004). Employees may adapt their job performance if they perceive an imbalance between effect and reward in their job (Feuerhahn et al., 2012). Previous studies have found that ERI can negatively affect job performance (Reizer & Siegrist, 2022).

China is in East Asia (Cohen, 2023). Providing high-quality health care to all Chinese citizens is part of China's healthcare reform plan (Li et al., 2020). Improving the job performance of nurses and then realizing the sustainable development of the hospital has become the focus of nursing management (Yu et al., 2022). In Chengdu, tertiary hospitals provide comprehensive medical institutions with multiple roles such as medical services, scientific research, and teaching. They account for only 7.66% of all-type health facilities yet provide 48.70% of the outpatient services and 42.50% of the inpatient care (Commission, 2016). They experience high bed utilization rates and patient inflows.

In tertiary hospitals, nurses' workloads are relatively heavy, requiring them to undertake larger patient volumes, provide higher levels of care, and engage with more complicated medical procedures (Li et al., 2024). The ratio of nurses to beds in Chengdu tertiary hospitals is 0.6:1 (Government, 2023). At the Fifth People's Hospital, conversations with nurses reveal experiences which include caring for 10-15 patients during a day shift; working night shifts alone (some departments); and one nurse even needing to take care of over 50 patients (Nurses, Personal Communication, 2023).

There are some problems with rewards in tertiary hospitals in Chengdu where the medical staff is least satisfied with salaries and welfare. Many of them have a monthly income below 8,000 CNY (58.6%) (Shi et al., 2023). In addition, due to stressful work hours, nurses lack the time and energy to provide patients and patients' families with emotional support (Chen et al., 2022). Complex and cumbersome work tasks reduce nurses' ability to empathize with patients and their families (Zhuang, 2021) which will affect the job performance of nurses.

Previous studies in different regions of China found have inconsistent results regarding job performance (Bai et al., 2021; Li, 2019; Tong, 2017). There is limited knowledge about job performance among nurses in Chengdu as well as about the relationship between ERI and job performance in China. Exploring effort-reward imbalance and job performance, and their relationships, can contribute to the improvement of nursing performance and can provide backing for the ERI model's interaction with job performance among nurses that could assist nursing managers in making efficient and effective strategies to enhance ERI, which would improve job performance.

Research objectives

This study aims to describe effort-reward imbalance, and task and contextual performance, and to examine the relationships between ERI and task and contextual performance of nurses in tertiary hospitals, in Chengdu City, Sichuan Province, the People's Republic of China.

Conceptual framework

The framework of this study was based on job performance by Greenslade (2008) and ERI by Siegrist et al. (2004). Job performance includes task performance and contextual performance. The ERI theory includes effort, reward, and over-commitment (OC). When nurses perceive an effort and gain imbalance, this imbalance can negatively affect on nurse's physical and mental well-being, as well decreased job satisfaction, increased stress, and ultimately, reduced task and contextual performance (Figure 1).

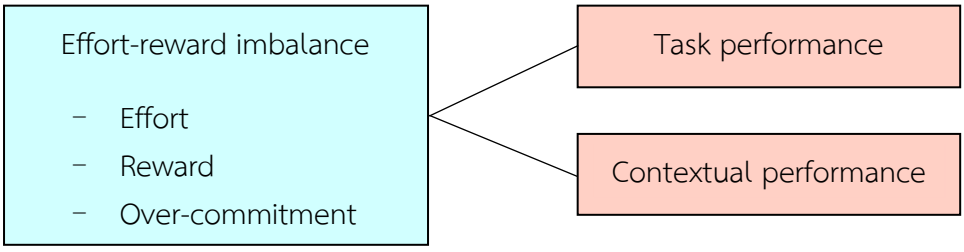

Figure 1 Conceptual framework of this study

Methodology

A descriptive correlational approach was applied in this study.

Population and sample

The target population of this study included 1,851 nurses from two tertiary hospitals in Chengdu City, Sichuan Province, the People's Republic of China. Nurses who had experience of more than one year and were involved in providing nursing care to patients were included. Nurses who were administrators or managers, or were on training, sick leave, or continued education for over one month were excluded.

The sample size for this study, 329 nurses, was calculated using Yamane's formula (Yamane, 1973) with a 95% confidence level. Considering a possible loss of 20% (Hogg & Craig, 1995), 66 nurses were added, resulting in a total sample size of 395.

A stratified random sampling method was employed. First, proportionally random sampling was used to determine the number of nurses in the two hospitals and the number of nurses in the departments, respectively. Finally, simple random sampling was used to select the participants from the department name lists. A total of 395 questionnaires were distributed with 367 were returned. A total of 329 (83.29%) were complete, met the sampling criteria, and were analyzed.

Research instrument

The study instrument consisted of three parts.

Part 1: A demographic data form was developed by the researcher; closed-end questions were used to collect relevant information from the participants.

Part 2: The ERI short version scale was developed by Siegrist et al. (2009). This scale was translated into Chinese by Li et al. (2012) while Shang back translated it into English. The back-translation was reviewed to check its agreement with Siegrist et al.'s original, and confirmation of the construct validity was satisfied (Li et al., 2012). The translated version had 16 items divided into three subscales: effort (3 items), rewards (7 items), and OC (6 items). Each item was rated on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree).

Effort-Reward ratio > 1 indicated exposure to ERI at work. A higher ERI value indicated a higher level of work stress, while scores close to zero indicated low effort with high reward (a favorable condition) (Siegrist et al., 2004). A score that was more than two-thirds of the overall over-commitment score (score= 18) meant a high score for over-commitment (Siegrist, 1996). The reliability was tested among 10 nurses in the two target hospitals with similar criteria as the subjects and the Cronbach's alpha coefficients were 0.72 for effort, 0.83 for reward, and 0.78 for over-commitment.

Part 3: The Nursing Performance Scale, developed by Greenslade (2008), was translated into Chinese by Ke (2012) using the back translation method. The translated version had 25 items and included two dimensions: Task Performance and Contextual Performance. Task performance included three factors: technical care (3 items), emotional support (4 items), and information (4 items). Its items ranged from 1 (very poor) to 7 (excellent). Contextual performance contained

three factors: job-task support (4 items), interpersonal support (5 items), and organizational support (5 items). Responses to the items ranged from 1 (Not at all) to 7 (A great deal).

Regarding the total scores for task performance, 11.00-33.00 points meant a low level, 33.01-55.00 points meant a moderate level, and 55.01-77.00 points meant a high level. For task performance, 14.00-42.00 points meant a low level, 42.01-70.00 points meant a moderate level, and 70.01-98.00 meant a high level. The reliability was tested with 10 nurses similar to the participants in the two target hospitals. The Cronbach's alpha coefficients were 0.86 for task performance and 0.84 for contextual performance. The scale was utilized without any word changes, and it had satisfactory validity (Ke, 2012).

Ethical considerations

The Chiang Mai University Faculty of Nursing's Research Ethics Review Committee gave its approval to the study (No. 101/2023). The target hospitals permitted the data collection. All participants received information about the goals and procedures of the study as well as the freedom to decline or withdraw participation at any moment without facing consequences or losing any advantages. The researcher used code instead of the participants' names, and the study's publications and research reports did not reveal their names or indirect information that might be recognized. After finishing the dissertation, the data was kept in a secure place and will be destroyed after the study has been completed for two years.

Data collection

To collect data, research coordinators, who were staff at the target hospitals without any position, were appointed by the directors of nursing. Their roles and the data collection methods were explained to them. Participants received the questionnaires from coordinators to complete in their free time, returning the consent forms and questionnaires in separate sealed envelopes to a locked box in the nursing department. Out of 395 distributed questionnaires, 367 were returned (92.29%). With 27 incomplete and 11 containing missing data, 329 (83.29%) were used for analysis.

Data analysis

Version 13.0 of the statistical package for the social sciences (SPSS) was employed. Nurses' ERI, task performance, and contextual performance levels were analyzed using mean and standard deviation. ERI was calculated as follows:

$$\text{ERI ratio} = \frac{\text{Scale of Effort}}{\text{Scale of Reward} * 0.4286}$$

Correlation testing was used to test the relationship between ERI task performance and contextual performance. Data distribution was checked using Kolmogorov-Smirnov with results showing p values over .05. Pearson's product-moment correlation was used to examine the relationship between ERI and task performance, as well as ERI and contextual performance. The interpretation scale for r was: ≤0.3 = low, .0.3-0.5 = moderate, > 0.5 = high (Burns & Grove, 2009).

Results

Demographic data: Most nurses were female (95.74%) with an average age of 32.94 (SD = 6.91), and 74.47% were married. Over half (51.98%) were incharge nurses, and most had graduated with bachelor's degrees in nursing (88.45%) and worked day and night shifts (76.90%). Under a third (29.18%) had 11-15 years of nursing experience.

ERI: 43.77% of nurses had an ERI ratio greater than 1, and a low level of over-commitment (Table 1).

Job performance: The participants reported that task performance and contextual performance were at moderate levels (Table 1).

Table 1 Frequency, Percentage, Mean, Standard Deviation, Range, and Level of ERI, Over-commitment, and Job Performance Among Nurses (n = 329)

Variable	Mean	SD	Range	Level	Frequency (percentage)
ERI ratio					
Less than 1					178(54.10%)
Equal to 1					7(2.13%)
More than 1					144(43.77%)
Over-commitment	15.70	2.80	6.00-24.00		
Job performance					
Task performance	53.73	11.03	24.00-77.00	moderate	
Contextual performance	63.92	12.78	37.00-98.00	moderate	

Relationship between ERI and Job Performance: There was a significant low negative relationship between ERI and task performance (r = -.14, p < .05) as well as between ERI and contextual performance (r = - .17, p < .01) (Table 2).

Table 2 Relationship Between the ERI and Task Performance and Contextual Performance Among Nurses (n = 329)

	Task performancer	level	Contextual performance	level
			r	
ERI	-.14*	weak	- .17**	weak

* p < .05, ** p < .01

Discussion

Nurses' ERI: This study found that 43.77% of nurses had an ERI that exceeded a value of 1, indicating that nurses perceived putting in more effort than the rewards they obtained. China is still facing a dilemma of insufficient manpower supply, and the huge elderly population further aggravates the shortage of nurses (Ouyang, 2022). The workload of nurses in tertiary hospitals is

relatively large, and they need to undertake more patients, higher nursing levels, and more complicated medical procedures (Li et al., 2024) whereas they obtain low rewards, such as for income. Yuan et al. (2016) reported nurses had low average monthly income. Their income satisfaction was 43.60%, and nurses were not satisfied with their current level of income (Yang, 2023).

However, in this study, the ERI value of 54.10% of nurses was less than 1. In this study, most of the nurses were satisfied with the deserved respect from superiors. Additional analysis found that 64.29% of ERI scores were less than 1 among nurses aged 40 to 50 years old. These nurses had extensive clinical knowledge and skills, particularly in management and teaching, and benefited from collaborative medicine, which enhanced their professional growth opportunities with higher salaries and rewards than younger nurses. This expertise and the collaborative environment also contributed to recognition from team members (Zhan et al., 2020), which led to an ERI perception of less than 1.

Task performance: This study's findings indicated a moderate level of task performance. In China, the duties of a registered nurse were mostly treatment-oriented and order fulfillment; they typically did skilled, professional tasks for patients, such as nursing assessment, medication delivery, and patient education (Jiang et al., 2015). Also, all activities performed by nurses were closely supervised according to nursing guidelines and routinely audited by nursing managers of the ward. In addition, hospitals established nursing quality control standards, such as patient administration guidelines, fall guidelines, tube risk management guidelines, bedside shift guidelines, and wristband identification guidelines, and the hospital made sure that the quality of care was regularly monitored for continuous improvement (Yang et al., 2024). These led to the focus on providing care to patients. However, nurses had a high workload. Tertiary hospitals provide 48.70% of the outpatient services and 42.50% of the inpatient care (Commission, 2016). The heavy workload of nurses not only affects their physical health but also may adversely affect job performance (Spagnoli et al., 2020).

Contextual performance: The findings indicated a moderate level of contextual performance. Due to the heavy workload, nurses did not do well in making special arrangements for patients or responding to families' needs, such as making special arrangements for a patient's family. However, teamwork facilitates the growth of employees' perspectives and skills by facilitating the natural flow of constructive criticism, ideas, experiences, and points of view among team members. This process also continuously improves the organization's services as well as workers' performance and creativity in their jobs (Sanyal & Hisam, 2018).

The Relationship Between ERI and Task Performance: The findings of this study revealed a weakly significant negative correlation between the ERI ratio and task performance (Table 2) which indicated that employees facing an imbalance between costs and gains in the workplace

could not provide the best task performance. This discovery aligns with a prior study conducted by Reizer and Siegrist (2022) among 399 employees in Israel which found a negative relationship between the ERI ratio and task performance. ERI often contributes to increased stress levels among employees (Siegrist et al., 2004).

High levels of stress can negatively impact cognitive functions, attention, and decision-making, all of which are crucial for effective task performance. In addition, the negative effects of ERI, such as stress and burnout (Hämmig et al., 2012), sleep quality (Deng et al., 2021), and musculoskeletal symptoms (Lee et al., 2014), can impact overall well-being. Physical and mental well-being are essential for sustaining high levels of task performance (Cooper & Quick, 2017). In addition, ERI can decrease employees' commitment to performing their job duties effectively, potentially leading to a decline in the thoroughness and effectiveness of their work (Siegrist et al., 2004).

The Relationship Between ERI and Contextual Performance: The findings of this study revealed a weakly significant negative correlation between the ERI ratio and the contextual performance of nurses in tertiary hospitals (Table 2). It also supports the result of a study by Feuerhahn et al. (2012) which indicated that ERI demonstrated a negative correlation with job performance. In China, the nurse performance appraisal standards formulated by some tertiary hospitals may be unreasonably designed which affects the authenticity and accuracy of performance appraisal data, demonstrating lack of an effective reference as well as performance appraisal information support (Yuan, 2023). The absence of adequate recognition and rewards for contextual performance may impact nurses' motivation to contribute beyond their basic duties (Ndungu, 2017).

In addition, high levels of stress due to the demanding nature of the healthcare profession can reduce nurses' motivation to engage in extra-role behaviors (Chen et al., 2022). When there is a perceived lack of fairness in the reward system, individuals may experience feelings of frustration, demotivation, and a lack of commitment. This negative reciprocity could lead to a decrease in contextual performance as employees may be less inclined to invest additional effort beyond their formal job requirements, and individuals may focus solely on their formal job duties without actively contributing to the broader organizational goals (Reizer & Siegrist, 2022).

Conclusion

Regarding nurses at tertiary hospitals in Chengdu, 43.77% perceived an ERI ratio greater than 1. Additionally, scores for task performance and contextual performance were at a moderate level. There was a significant negative relationship between ERI and both task performance and contextual performance.

Application of research findings

To improve job performance, nurse administrators should optimize workload distribution, provide necessary support and resources, and offer rewards for nurses' contributions to patient care. To reduce effort-reward imbalance, nurse administrators should hire temporary or part-time

nurses to help with short-term needs and increase full-time staff for long-term sustainability. Fair evaluation, compensation, and recognition should be prioritized to foster a supportive work environment. Additionally, comprehensive training and support should be provided to young nurses to help them adapt to the demands of tertiary hospitals.

Recommendations for further study

It is recommended to replicate this study in other regions or types of hospitals in China and to explore moderating variables such as individual differences, organizational culture, and job characteristics, along with other factors influencing job performance among nurses.

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