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Review Article

Improvement Plan of Nurse Staffing Standards in Korea

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ABSTRACT

Purpose: This study compares the expected nurse-to-patient ratio, penalties for violating these regulations, and the laws enacted in the medical and nursing fields in Korea and advanced countries like Germany, Australia, the United States, and Japan.
Methods: This study deployed an integrative review method and used search terms such as “nursing law,” “nurse ratio,” “nurse,” “nurse staffing,” “health,” and “staffing” to find articles published in English, Korean, German, or Japanese through Cumulative Index to Nursing and Allied Health Literature Plus with Full Text, the Westlaw (International Materials-Jurisdiction) site, US government and state sites (federal parliament, National Conference of State Legislatures), and Google Scholar.
Results: Compared with medical laws in other advanced countries, Korean laws are quite crude and its nurse-to-patient ratio does not reflect patients' status. Korea also lacks strict penalties for nurse staffing ratio violations.
Conclusion: Korea requires a strong regulatory apparatus for nurse staffing in health-care organizations to improve the quality of its health-care services and patient safety.
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Introduction

Researchers report the stable professional nursing staff at health-care organizations is one of the essential requirements to provide ideal patient outcomes, reducing falls, infections, medication errors, mortality, and pressure ulcers, through meta-analysis and systematic literature reviews for decades [1–3]. Extant research highlighted that the lower the nurse staffing levels with higher turnover rates, the higher the nurses' dissatisfaction and intention to leave [3–7]. The rigorous research reported that insufficient nurse staffing contributed to 24% of adverse outcomes such as patients' mortality rates, cognitive impairment, and permanent loss of function; nurse staffing levels and overtime relate to patient safety, quality of care, and inadequate care; and about 84% of medication errors affecting patients would diminish with increasing numbers of licensed nurses [8]. The composition of nurse staffing levels also relates to hospitals' mortality rate, which increases as the number of patients per nurse increases [9–14]. In addition, when nurse staffing levels and the ratio of nurses to patients is higher, days of hospitalization decrease [14,15] along with readmission rates [7,16,17]. The levels of nursing staff also affect nurse outcomes leading to burnout, job dissatisfaction, and attrition intention. Because nurses' exhaustion is higher when their staff levels are lower [5–7], the adequate nurse staffing concept is changing from minimum to safe expected staffing to ensure patient safety and quality of nursing care.

Based on the study results, most advanced countries have proposed specific nurse staffing standards through the enactment of nursing laws. However, in Korea, the quota of nurses allocated to health-care organizations was established in 1962 [18] as 2 per 5 inpatients (30 outpatients converted to 1 inpatient), then deleted in 1973 [19] and reestablished in 1983 [20].

Some research still supports research results on the positive effects of nursing law enactment, including patients' perspectives (mortality rates) and nurses' perspectives (increased satisfaction with decreased turnover) [21–23]. Furthermore, cost-effective results followed by the enactment of nursing laws also supported the cost benefits of having more registered nurses (RNs) compared with expenses related to training nurses and caring for patients [23–25]. According to the International Council of Nurses, more than 80 countries have enacted and implemented nursing laws, and state-by-state nursing legislation is being enacted even in countries already having nursing laws [26]. The International Nursing Council

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also supported the enactment of nursing laws in Korea [27]. Despite worldwide research on the important role of professional nurses in patients' safety, the standard quota of nurses to patients remains the same as mandated in the 1962 enactment in Korea. The quota of nurses was based on an annual average of inpatient care per day, according to the classification of health-care institutions (considering 12 outpatients as one inpatient).

Currently, the most powerful traction for regulating nursing staff in Korea is Differentiated Inpatient Nursing Fees (*Ganho kwanri chadeungjae*) according to the nurse staffing levels in the general ward and intensive care unit (ICU). This measure was introduced in November 1999 for hospitalization in the general ward to address the problem of poor-quality nursing services such as delegating tasks of the nursing service to the caregiver or guardian in health-care settings that did not have adequate nurse staffing [28]. Integrated nursing care (*Ganho kanbyoung tonghap service*) was implemented to improve patients' safety by providing comprehensive coverage of nursing care by RNs rather than by caregivers who are not professionals, thereby relieving caregivers' physical, psychological, and financial burden [29]. Integrated nursing care services is a system that stops patient care performed by the caregiver or family members in general wards in Korea and provides all nursing services by nursing professionals in the wards where the caregiver does not reside. The National Health Insurance Corporation has paid the cost of integrated nursing care services since 2015 [30]. This system has begun to alleviate the burden of care for patients and their families and to improve patient safety [31].

Owing to implementation of Differentiated Inpatient Nursing Fees (*Ganho kwanri chadeungjae*) in 2007 and integrated nursing care *(Ganho kanbyoung tonghap service)* in 2013, the nurse-to-patient staffing ratio slightly improved, based on the Enforcement Regulation of the Medical Service Act: Paragraph 4, Article 1 in Korea. Specifically, concern emerged about the validity of the nurse staffing standards specified in Korea's Medical Service Act because 1,631 (65.8%) Korean hospital-level organizations have violated the mandated staffing quota standards, and about 13.2% nursing facilities had insufficient numbers of nursing staff [31].

It is quite timely to review the actual number of patients for each work shift per nurse by referring to advanced countries' cases that emphasize the importance of patient-to-nurse staffing criteria. This study compared and analyzed the expected nurse-to-patient ratio, penalties for violating such regulations, and the state of laws enacted in health care in Korea and the advanced countries of Germany, Australia, the United States, and Japan.

Methods

Research design

In this study, we conducted an integrated literature research to examine the current state of nurse staffing and explored possible policy improvements in Korea.

Literature search method

Search materials

This study used the following search engines: Cumulative Index to Nursing and Allied Health Literature Plus with Full Text, Westlaw (International Materials-Jurisdiction), US government and individual state sites (federal Congress, National Conference of State Legislatures), and Google Scholar.

Search terms

This study used “nursing law,” “nurse ratio,” “nurse,” “nurse staffing,” “health,” and “staffing” as search terms.

Literature selection criteria

Only English, Korean, German, and Japanese literature published since 2015 was included.

Results

Nurse-to-patient ratio

The nurse-to-patient ratio is summarized by nation in Table 1. The nurse-to-patient ratio was specified by the Medical Service Act in Korea and Japan, whereas it was described in the United States and Australia by the Nursing Act and in Germany by the Nursing Strengthening Act.

Republic of Korea

Since 1962, Korea has specified health-care professional staffing standards according to types of health-care organizations, in line with Article 36 of its Medical Service Act. As shown in Table 1, the current quota of nurses in tertiary referral hospitals, general hospitals, and dental clinics was obtained by dividing the daily average number of hospitalized patients based on annual numbers by 2.5, whereas Eastern medicine hospitals and nursing homes apply looser standards (5 and 6 patients, respectively). Apart from the Medical Service Act criteria, the Korean government tries to improve nurse staffing levels by paying hospitals Differentiated Inpatient Nursing Fees based on nurse staffing. In general wards, nurse staffing levels are differentiated by type [32], a method that adds or subtracts fees as per grade. Upper level general hospitals have 6 grades, and general hospitals and hospital-level institutions have 7 grades. However, the standard level of nurse staffing without reduction of admission fees ranged from 4.0:1 or more for higher level general hospitals to 4.5:1 and 6.0:1 for general hospitals and hospital-level institutions, that is, one nurse is in charge of about 20 patients, obtained by multiplying 4.0 by 4.8 (multiply by 4.8 to calculate the number of occupied beds attended by one nurse per duty, considering the total number of nurses taking three shifts and 1.6 times the number of the workforce available for off-duty and vacations), for tertiary referral hospitals and about 22 and 29 patients, obtained by multiplying 4.5 and 6.0 by 4.8, for general hospitals and hospital-level institutions, respectively. This is unreasonably substandard compared with foreign standards.

The United States

In the United States, federal and state laws establish laws for nurse staffing. Federal law rests on Code 42 of Federal Regulations [33] along with the Nurse Staffing Standards for Patient Safety and Quality Care Act of 2017. Advocating professional nurses' contribution to positive patient outcomes, the Nursing Act states that assistive personnel cannot replace professional registered nurse staffing. The Nurse Staffing Act, the public health act that includes the number of patients rather than the percentage of direct nursing staff, publishes information about nurse staffing, and health-care records of actual nurse staffing have been brought into the US House of Representatives. The nursing laws of four states—California, New York, Massachusetts, and New Jersey—define patient-to-nurse ratios. Characteristically, Massachusetts has defined the ratio of patients rather than the number of direct care nurses in ICUs, whereas California, New York, and New Jersey defined the ratio of patients rather than direct nursing nurses in the nursing unit. The state of Ohio has also proposed a bill regarding

Table 1 *Nurse-to-Patient Ratio by Country.*

	Law		Ratio	
	Medical law	Nursing law	Ratio of RN:patient	Ratio of RN:bed
Korea	Medical Law Article 38			**2.5:1 (inpatient)** **12:1 (outpatient)**
Japan				**3:1**
Germany			1:10	
United States				
California		Nurse Staffing Standards for Patient Safety and Quality Care Act of 2017 (H R.2392)	Trauma emergency/operating room = **1:1** Intensive care unit, neonatal intensive care unit, emergency intensive care unit, labor and delivery unit, coronary care unit, acute respiratory care unit, postanesthesia unit, burn unit = **1:2** Emergency room, pediatric unit, step down unit, telemetry unit, antepartum unit, labor, deliver, and postpartum unit = **1:3** Medical–surgical unit, intermediate care nursery unit, acute care psychiatric unit, other specialty unit = **1:4** Rehabilitation and skilled nursing unit = **1:5** Postpartum, well-baby nursery unit = **1:6**	
Massachusetts		Bill H. 4228/M.G.L.A. 111 § 231	Intensive care unit = **1:1** or **1:2**	
New Jersey		SENATE, No. 989	Medical/surgical unit = **1:5** Step down unit, telemetry unit, intermediate care unit = **1:4** Emergency room = **1:4** Emergency intensive care unit = **1:2** Trauma service of an emergency room = **1:1** Behavioral health or psychiatric unit = **1:5** Intensive care unit, neonatal unit, burn unit = **1:2** Anesthesia in an operating room = **1:1** Postanesthesia patients in a recovery room, postanesthesia care unit = **1:2** Labor and delivery unit = **1:2** Rooming-in = **1:4** Postdelivery mothers-only unit = **1:6** Pediatric unit, intermediate care nursery unit = **1:4** Well-baby nursery unit = **1:6**	
New York		Safe Staffing for Quality Care Act (Assembly Bill No. 1532)	Operating room, trauma emergency unit, maternal/child care unit for the second or third stage of labor = **1:1** Maternal/child care unit for the first stage of labor, emergency intensive care unit, postanesthesia unit = **1:2** Antepartum unit, emergency room, pediatric unit, step down unit, telemetry unit, unit for newborn and intermediate care nursery unit = **1:3** Postpartum rooming-in = **1:3** (to maximum six patients per nurse = **1:6**) Noncritical antepartum unit, postpartum mother only unit, medical/surgical unit, acute care psychiatric unit = **1:4** Rehabilitation unit, subacute unit = **1:5** Well-baby nursery unit = **1:6**	
Connecticut		Public Act 08-79, An Act concerning Hospital Staffing		
Illinois		Public Act 095-0401		
Texas		Health and Safety Code Chapter 257, Nurse Staffing		
Ohio		Safe Nurse Staffing Law		
Australia				
Victoria			Medical and surgical = **1:4** to **1:6** ER = **1:3** (excluding charge or triage nurse)	
Victoria		The Safe Patient Care (Nurse to Patient and Midwife to Patient Ratios) Bill 2015	Public acute medical and surgical = **1:4** ER = **1:3** (excluding charge or triage nurse) one in-charge nurse and two triage nurses Larger regional hospitals = **1:4** on morning shifts, **1:5** on afternoon shifts, **1:8** on night duty shifts, plus an in-charge nurse on all shifts.	
Queensland		Hospital and Health Boards Amendment Regulation (No.2) 2016 Part 6A 30B	Acute adult wards = **1:4** on morning shifts and afternoon shifts and **1:7** on night shifts	

Note. ER, emergency room; RN, registered nurse. The bold mean specific countries, while not-bold ones are states of united states.

Table 2 *Regulation on the Violation of Nurse Staffing by Country.*

	Medical law	Nursing law	Penalty content
Korea	Medical Law 63		The Minister of Health and Welfare or the mayor/governor/head can order correction of a certain period of time to limit or prohibit the use of facilities, equipment, and so on.
Germany	–	–	–
United States			
California		Nurse Staffing Standards for Patient Safety and Quality Care Act of 2017 (HR. 2392)	1 Civil money penalty 2 Enforcement of public release on the violation
Minnesota		Quality Patient Care Act (H.F. 2650)	1 Civil money penalty 2 Enforcement of public release on the violation
Nevada		Prescribes requirements concerning the care of patients in facilities for skilled nursing (BDR 40-417) (AB242)	1 Civil money penalty
		SB 362	1 Suspension or cancellation of license of health-care organization 2 Monetary penalty 3 Corrective action by health division including decreasing patients per unit, limiting additional admissions
New Jersey		NJ Rev Stat § 26:2H-5f, 5g, 5h	1 Monetary penalty
Ohio		Safe Staffing for Nurse and Patient Safety Act of 2018 (H R. 5052)	1 Civil money penalty
Oregon		ORS § 441.154	1 Civil penalties 2 Suspension or cancellation of license of the health-care organization 3 Enforcement of public release on the violation
Australia (Victoria state)		Safe Patient Care (Nurse to Patient and Midwife to Patient Ratios) Act 2015	1 Monetary penalty 2 Limitation on the operator

the minimum patient-to-direct care nurse ratio. Representatively, California's 2392 Act [33] suggested minimum nurse staffing considering patient severity such as a 1:1 ratio for trauma emergencies and the operating room and a 1:2 ratio for the ICU, neonatal ICUs (NICUs), and delivery, circulatory, respiratory, and anesthesia units. In addition, it is mandatory to form and operate a nurse staffing committee comprising more than 50% of direct care nurses. The Safe Staffing for Hospital Care Act Bill S. 1634-2013 of New York, Public Act 08-79 in Connecticut, Public Act 095-0401 in Illinois, Health and Safety Code Chapter 257 in Texas, and Ohio's safe nurse staffing law (Ohio Revised Code, sections 3727.50 to 3727.57) make it compulsory to establish nurse staffing plans, reflecting patient severity and nursing unit characteristics. The nursing service plan led by the nurse staffing committee continuously monitors stable nurse staffing and patient quality and supervises overall matters (records, representativeness, quality management, and so on) of each hospital's nursing staff and consistently evaluates nurse-sensitive quality indicators.

Australia

Australia has a reasonable level of nurse staffing laws/guidelines that depend on the type of the nursing unit and the size of the hospital. The Public Health System Nurses' and Midwives' (State) Award gives detailed information on the definition of nurse staffing, work patterns, staffing standards, salaries, benefits, vacations, and regulations related to career and position. Its nurse staffing standard specifies the number and composition of nurse staffing according to the organizations and work shifts.

In Victoria state, staffing rates, excluding charge nurse or triage nurse, range from 1:4 to 1:6 nurse-to-patient ratios for internal/surgical wards and 1:3 for emergency rooms. California, where mandatory nurse staffing is applied, clarifies the boundaries of nurses' duties considering aspects such as severity of illness, available medical devices, complexity of nursing, and self-care ability of patients. Victoria too considers these aspects and determines staffing by setting need-based, flexible standards. Queensland introduced nurse staffing in 2016 and is now conducting a second campaign to increase implementation. As part of this campaign, the degree of implementation of nurse staffing, aggregated by states and regions separately, is posted on the state government's health-related website every month with a very high compliance rate of 98% to 100% [34]. In addition, the nurse staffing for Queensland was estimated to have a 1:4 nurse-to-patient ratio for day and afternoon shifts and a ratio of 1:7 for night shifts in acute adult wards [34].

Germany

German nurse staffing standards specified by federal and state laws have been applying nurse-to-patient ratios from the implementation of the health-care system in 1995, based on staffing of nurses and nursing assistants in nursing homes according to the Nursing Insurance Act (long-term care insurance). Although Nursing Staff Regulation (NSR) *Pflegepersonalregelung* (PPR), the minimum regulation standard for hospital nurse staffing, was applied to all hospitals in Germany between 1993 and 1995, the government eliminated these regulations on January 1, 1997, without taking further measures to cope with the financial burden of recruiting more than 20,000 nurses. However, the Nursing Managers Association of German university hospitals has supplemented the abolished PPR Nurse Staffing Standard, and it is still used informally to estimate nursing staff and budgeting of nursing departments. In other words, nurses at German university hospitals identify and measure nursing needs every evening for nursing care and basic care—support for activities of daily living (ADLs) support [35]. However, because no standard exists to legally guarantee nurse staffing, each hospital operates its staff flexibly as per patients' severity and the need for nursing care. Hopitals hire less nurses because reduction they prioritize nursing staff and restrict staff hiring by diagnosis-related group (DRG).

Compared with other European countries [4], Germany has a higher burden of nursing work (a nurse-to-patient ratio of 1:13 or higher) and a lower proportion of nursing assistants The problem is that the German DRG, introduced in 2004, accounts for 98% of the total diseases in 2018 and has compiled 1,292 DRGs. The German DRG reflects only 60–70% of caregivers' ADL support among German nursing services, which is an integrated nursing care,

resulting in significant daily workload for nurses. To address this nursing shortage, the German House of Representatives passed the Nursing Enhancement law on November 9, 2018, with an emergency program that did not require the Senate's consent. As a result, salaries of additional recruits and individual workers in all hospitals and nursing homes in Germany have been reimbursed by health or long-term care insurance benefits since 2018, and financial arrangements have been specified by law [36].

The guidelines for nurse staffing standards of delivery units and NICUs have been set as federal standards since 2015 as a sublaw norm for the Federal Commission [37]. In NICU Levels 1 and 2, nurses specializing in pediatric ICU should comprise 40% and 30% of the staff, respectively, and it is compulsory to have a nurse specialized in pediatric ICU per work shift. For Level 1 premature child centers, the nurse-to-premature baby ratio is 1:1, and for Level 2, it is 1:2. Unsuccessful hospitals need to notify the Federal Commission of unsatisfactory circumstances along with the reason, requiring the state to hold a separate conversation with unsuccessful hospitals about their nurse staffing status [37]. Berlin and Nordrhein-Westfalen comply with the regulation of the 1:2 nurse-to-patient ratio for ICUs and 1:1 for special care units, and at least 30% of the departmental nurses should be specialized in ICU nursing, according to the minimum nurse staffing recommended by the German ICU and Emergency Medicine Interdisciplinary Academy [38]. The city of Berlin applies a minimum standard of 1:1.35 to 1:1.8 nurse-to-patient ratios for geriatric wards and for patients with acute illness and 1:5.5 to 1:1.62 for day care clinics [38].

In accordance with the federal regulations on the minimum standards of hospital nurse staffing (October 10, 2018), the standard of nurse staffing needs to be 1:2.5 for the day shift (morning and afternoon shifts: 6 am to 10 pm) in the ICU and 1:3.5 for the night shift (10 pm to 6 am), and from January 2021, must have staffing securement in phases: 1:2 nurse-to-patient ratio for day shifts and 1:3 for night shifts [36]. Because this level of staffing is lower than the 1:2 nurse-to-patient ratio in ICUs already applied in the cities of Berlin and Nordrhein-Westfalen, criticism has emerged about its inadequacy owing to the level of nursing services, patient safety, and increased burden for nurses [39].

Taking effect in January 2019, the minimum staffing standard applied to all hospitals in Germany is a 1:10 nurse-to-patient ratio for day shifts (6 am–10 pm) and a 1:20 ratio for night shifts (10 pm–6 am) in elder wards. The required staffing in the trauma ward is a 1:10 nurse-to-patient ratio for day shifts and 1:20 for night shifts, whereas the heart disease wards needs a 1:12 nurse-to-patient ratio for day shifts and 1:24 for night shifts. If the number of patients is less than the threshold for a single nurse, one nurse should be deployed for the patient's safety [36].

Nurses and nursing assistants in nursing homes providing chronic disease care were assigned a nurse-to-patient ratio based on the level of nursing needs after the introduction of the system in 1995. Nurses were deployed depending on the degree of patients' loss of self-reliance on ADLs, and the ratio of nurses to nursing assistants increased to more than 52%, from 50%, in 2017. The nurse-to-patient ratio for the first grade, mild cases, is 1:7.25, 1: 3.9 for the second grade, 1:2.8 for the third grade, and 1:2.2 for the fourth grade, and for the most serious cases (fifth grade), it is 1:1.8. In cases of patients with dementia and mentally disability, the nurse-to-patient ratio for the first grade, mild cases is 1:4.12, 1:2.77 for the second grade, 1:2.16 for the third grade, and 1:1.79 for the fourth grade, and for the fifth grade, the most serious cases, it is 1:1.51. In the case of patients with intellectual disability and multiple disabilities, nursing requirements are recognized as Grades 3 to 5, with a nurse-to-patient ratio of 1:1.96 for the third grade, 1:1.14 for the fourth grade, and 1:1 for the most serious fifth grade. For unconscious patients requiring intensive care, one nurse is assigned per patient and the ratio of nurse to nurse assistant is at least 70%. For long-term ventilator patients, one nurse per patient is required, with a minimum nurse-to-nurse-assistant ratio of 80%. To maintain the quality of nursing services, the ratio of low-wage workers should not exceed 5%, and the standard of patients per nursing staff has been revised in favor of patients. The standard for additional caregivers, such as safety guardians of patients with dementia and companion roles, has been enhanced from 1:24 to 1:20, and caregivers are not included in the nurse-to-nurse assistant ratio [39].

The Nursing Enhancement Act, enacted on November 9, 2018, specifies 13,000 additional nurses in nursing homes, with finances covered by health insurance benefits. Facilities with up to 40 residents should have an additional 0.5 nurses, facilities with 41 to 80 people should have one nurse, facilities with 81 to 120 people should have 1.5 nurses, and facilities with more than 120 people should have two more nurses, and part-time nurses may also be considered. In the event of compliance with the nurse staffing ratio with nurses not available, despite intensive efforts, it is inevitable to replace nurses with nursing assistants attending nursing school and doing exceptionally well academically, 4 months after the recruitment announcement. This policy was supported by the health insurance service because the goal is to partially cover expenses related to nursing care for elders, especially in relation to nursing care by doctors' prescription [36].

Upon application, nursing homes will receive extra funding to promptly add staff and, in particular, nurses, without complicated administrative procedures. Failure to comply with legal staffing standards will result in suspension of new admissions [36].

Japan

The basis for Japan's nurse staffing standard is its Medical Law Enforcement Regulations that classifies staffing according to bed types (general, nursing, mental illness, infectious disease, tuberculosis), by applying a minimum staffing standard (including registered nurses and practical nurses), with one nursing staff member caring for 3 inpatients [40]. This was amended in 2001, specifying Article 19 of the Enforcement Regulation of the Medical Law based on Article 21, Paragraph 1 of the Medical Act, but in actuality is based on the standard of each nursing department. The Enforcement Regulations of the Medical Law stipulate that the size of the nursing staff should be based on the total number of people in the hospital. For example, for 500 general beds, an average of 450 inpatients, and a daily average of 900 outpatients, the requirement of nurses is calculated as 150 for inpatients (450 divided by 3) and 30 for outpatients (900 divided by 30), for a total of 180. Since 2006, Japan has been able to assess nurse staffing levels from the perspective of patients' nursing care needs by including practical nurse staffing to calculate basic hospitalization fees.

Penalties imposed by nations for violations of nurse staffing regulations

Table 2 shows the punishment and regulations for violations of nurse staffing requirements by nation.

Republic of Korea

Although Article 63 of the Medical Service Act permits issuance of corrective orders and prohibits the use of facilities for a certain period of time, guidelines are only nominal because no specific standards relate to penalties. Korea has replaced legal standards pertaining to nurse staffing regulations with disincentives for nonconformity to nurse staffing levels.

In April 2007, to improve the distribution of the majority of hospitals in Grade 6 hospitals and Grade 4 general hospitals, the grade of nursing institutions and general hospitals was adjusted to Grade 7. Despite the addition of hospitalization fees based on the number of beds-per-nurse ratio calculations, and system improvements, they have made no substantial difference to the majority of Grade 7 hospitals that still have difficulty attaining sufficient nurse staffing. Consequently, the standard was reset, and, based on Paragraph 4, Article 7 of the Enforcement Regulations of the Income Tax Act, health-care organizations in vulnerable areas were exempted from deductions, and the deduction level was eased by 2% in areas other than Seoul and metropolitan cities [41].

However, based on the revised 2018 bill, Grade 7 was applied to unreported general hospitals and Grade 6 to unreported higher level general hospitals, clinics, and Eastern medical clinics, which shows it is not possible to identify unreported institutions' actual condition. Although Grade 6 is applied to tertiary referral hospitals, admission fees were not reduced. Because Grade 6 has the lowest nurse-to-patient ratio of 4:1 or more, actually it is about 20 patients per nurse, considering three shifts and staff going in and out of the facility. Although it is impossible to provide quality nursing care and ensure patient safety under these circumstances, considering patients' severity in general hospitals, deductions or penalties are not imposed, inevitably resulting in overtime for nurses, threatening patient safety. For general hospitals, Grade 7 is applied, and for Grade 6 facilities, which have no reduction in the admission fee, one nurse is in charge of about 29 patients. In Grade 7 facilities, the lowest grade, nurses are in charge of more patients than those who work in Grade 6 facilities, but the admission fee deduction is a maximum of 5%, which means that the admission fee deduction is less than the cost of employing a nurse. It would, therefore, be beneficial to reduce hospitalization fees without employing nurses for hospital operations.

The United States

Penalties for violating nurse staffing stipulated by the Nursing Act is prescribed in six bills in five states. When staffing matters in the nursing law are breached, in addition to levying fines, strong legal sanctions such as the suspension and cancellation of a hospital's license, restriction of hospitalization, and obligation to publish violated matters on their website are imposed.

Germany

The Nurse staffing – Promotion Program, introduced with the Hospital Rescue Act to support the recruitment of hospital nursing staff from 2015 to 2019, has been extended beyond 2018. The upper limit of the existing supplementary funds paid by insurers has been eliminated, and the hospital's 10% burden was abolished. The resulting additional funds will be used only for new employees' labor costs because, according to the Nursing Enhancement Act, the entire amount will be covered by health insurance and, if not, will be taken back by the insurer [36]. Under the scope of the nursing budget, when the hospital outsources the distribution of meals previously performed by nursing staff to improve the flow of work or relieve nurses' burden, it is supported by the insurer but taken back if unsuitable for the purpose. The minimum nurse staffing standard for hospitals was to be implemented beginning in January 2019, subject to a 3-month grace period until March, and compensation for the cost of medical care to noncompliant organizations was to be reduced beginning in April [36].

In Nordrhein-Westfalen, the hospital itself can close its ICU if it fails to comply with the minimum nurse staffing standards required for patient safety in the ICU. Nursing homes will also have to stop accepting admissions if they fail to comply with the legal standard [39]. Germany developed and expanded its minimum nurse staffing standards based on individual nursing needs to improve and maintain the quality of its nursing services and ensure patient safety, despite the constant shortage of nursing staff. To resolve the nursing workforce shortage, each hospital needs to maintain the financial records of labor costs incurred for recruiting new nursing staff, and these will be fully funded retrospectively from August 2018 by the National Health Insurance as per the Emergency Support Program of the Nursing Enhancement Act.

The nurse-to-patient ratios and nurse-to-nurse assistant ratios implemented in January 2019 will gradually be extended to the entire nursing field by 2021. Organizations that fail to comply with minimum nurse staffing standards will be subject to strict regulations including fines and retrieval of all subsidies. Another implication was to use nurses' expertise for patient safety, and to assuage the serious shortage of nursing staff, nurses should provide nursing while care nurse assistants carry out routine activities according to the care plan, under nurses' instructions and supervision.

Australia

As per the Safe Patient Care (Nurse to Patient and Midwife to Patient Ratios) Act 2015 of Victoria, the magistrates' court may apply monetary compensation or work restrictions to hospitals that do not meet the nurse staffing regulations [42].

Discussion

We propose the following policy measures for nurse staffing after comparing and analyzing the medical and nursing laws of Korea. First, it is necessary to revise the current nurse-to-bed ratio to align with the nurse-to-patient ratio, that is, the actual number of patients for each work shift per nurse. Most advanced countries featured in this study present nurse-to-patient ratios based on the number of patients, but Korea requires standardization based on the number of patients because Korea has a dual structure, applying the nurse-to-bed ratio (reflecting the rate of hospitalization) under the Medical Service Act and the Differentiated Inpatient Nursing Fee system and the nurse-to-patient ratio (the actual number of patients each nurse is in charge of) under the integrated nursing care guideline.

ICUs or special care units apply different standards for nurse staffing based on the recently introduced Differentiated Hospitalization Fee for ICUs [43]; the nurse staffing standard for the stroke ICU is 1.25:1 or less, based on the number of beds, whereas the actual number of patients per nurse is 6 by multiplying 1.25 by 4.8. In addition, the nurse staffing standard for high-risk pregnant patients in the ICU is 1.5:1 or less, based on the number of beds, and the actual number of patients per nurse is about 7.2. General ICUs were classified as ninth-grade ICUs [44], and the 2008 nurse-to-bed ratio was applied. These figures imply that each nurse should be responsible for about 10 ICU patients.

The Differentiated Hospitalization Fee for the NICU was introduced on October 1, 2007 [45]. In June 2018, it was revised to the sixth grade for tertiary referral hospitals and general hospitals and to the fifth grade for dental, Eastern medicine, and other hospital ICUs [46]. However, when converting to nurse-to-patient ratios, the result was about 2.4, by multiplying 0.5 by 4.8, for the first grade before adjusting for grade (three shifts, 1.6 times securing nurse staffing) and 9.6 for the fifth grade, by multiplying 4.8 by 2.0, before adjusting for grade or about 10 NICU patients per nurse. The minimum standard is 1:2 in the ICU and 1:1 in the pediatric ICU. It is even lower than California, which has the lowest nurse-to-patient ratio of 1:5 in its general ward. Patient safety has been seriously threatened in the ICU, which was specifically designed to monitor critical patients.

Moreover, in the integrated nursing care service (a pilot project started in 2013), providers' nurse staffing is determined by Paragraph 4, Article 1 of the Enforcement Regulation of the Medical Service Act, whereby tertiary referral hospitals should have 1 nurse per 7 beds, general hospitals should have 1 nurse per 12 beds, and other hospitals should have 1 nurse per 14 beds. In 2016, when the integrated nursing care project was expanded, the nurse staffing standards applicable to public hospitals were revised from the number of beds per nurse to the number of patients per nurse (equal to private hospitals), and the new standards of 1:5 and 1:6 were established for nurse staffing in tertiary referral hospitals. In September 2016, a new 1:7 nurse-to-patient ratio was established for general hospitals with high severity (nursing need level), the upward and downward indicators in nurse staffing were deleted, and a 1:16 or less nurse-to-patient ratio for hospitals was established [47]. Only health-care organization satisfying this proposed nurse staffing standards can select a nurse-to-patient ratio of 1:5 or less for tertiary referral hospitals, 1:7/1:8 or less for general hospitals, and 1:10 or less for hospitals based on medical institution type, and in such cases, the nursing assistant level of 1:40 or less for tertiary referral hospitals and 1:30 or 1:40 for general and other hospitals was recommended [48].

Second, it is crucial to adjust the number of patients per nurse to a level that can ensure national health and patient safety. Although the first grade (comprising the general ward and ICU and garnering the highetst nursinc care fees) need to be raised to the level of advance countries, depending on the characteristics of the nursing unit. The application of standard grade, without any reduction, should be realistically adjusted so compulsory nurse overtime is not required. In general wards, the nurse-to-patient ratio, based on the number of patients presented in the integrated nursing care guidelines, may be the practical minimum standard. The nurse staffing of actual integrated nursing service providers by nurse-to-bed ratios revealed that most tertiary referral general hospitals were less than 2.0:1, general hospitals ranged from 2.0 to 2.5:1, and other hospitals were less than 2.5 to 3.0:1 [49]. The actual number of patients each nurse is in charge of, based on nurse-to-patient ratios, showed 1:6 as the highest ratio for highest level general hospitals and 1:10 as the highest ratio for general hospitals [12]. Nevertheless, to improve patient safety and quality of medical care, we suggest raising the nurse staffing standard to 1:4 for highest level general hospitals and 1:6 to 1:7 for general hospitals [12].

The number of hospitals participating in the integrated nursing care service has increased by approximately 35 times for the number of hospitals, 27 times for wards, and 22 times for beds during the 5 years beginning in 2013. Integrated nursing care service has been expanding despite the shortage of nursing personnel, which is the biggest obstacle. In addition, researchers reported that nurses in integrated nursing care wards have less job stress, higher job satisfaction [50], and lower attrition intentions [51] than nurses in general wards. These results can be interpreted as the effect of compliance with the nurse staffing standards, which have improved the working environment for nurses in Korea. Therefore, it is necessary to improve the working environment by maintaining the appropriate nurse staffing standards, beginning by adjusting the number of patients under each nurse's charge.

To provide relief to local hospitals finding it difficult to secure nurse staffing, in 2018, the Differentiated Inpatient Nursing Fees for local hospital patients were revised [41]. Beginning in April 2018, some nursing institutions were advised to use the additional nursing care fees generated from the amended standard relating to the ratio of the number of beds to the number of patients, to improve the treatment of nurses. The status of improvement by nursing institutions applying the standard is being monitored. As a result, the lower the operation rate of beds, the higher the nursing grade.

Third, penalties and strengthening of the reduction ratio are necessary when nurse staffing does not comply with regulations. Nurse staffing standards specified in the Medical Service Act are presently ineffective owing to a lack of specific punishment standards for noncompliant institutions, and these limitations have been supplemented by the incentive system that has made no real difference. Furthermore, because it is impossible to identify the actual situation for nonreporting or rating hospitals with a certain grade or lower, they are assumed to have the lowest grade, and only a 5% adjustment for grade is made at hospital admission point. Because the 5% reduction is far less than the nurse recruitment cost, a structural problem exists whereby the loss is not enough to drive nurse recruitment. Therefore, reporting on nurse staffing levels should be made mandatory to enable readjustment of the scope of reduction according to grade so that recruitment of nursing staff leads to a structure that can compensate for the loss owing to the reduction.

Fourth, it is imperative to mandate notification of nurse staffing levels and establish a reporting system for nurse staffing. One of the major disadvantages with the existing Differentiated Inpatient Nursing FeesFee system of Korea is that it regards unregistered institutions' nurse staffing levels at the lowest grade: Grade 7. Because the institution's actual status is unknown, it is predicted that the level of unregistered institutions will be substantially lower than the standard applicable to Grade 7. In addition, reliable data should be obtained to evaluate compliance with nurse staffing standards.

At present, it is difficult to measure the ratio of the actual number of patients that nurses care for each day based only on the number of beds and bed-to-operation ratio. Thus, it is necessary to evaluate the validity of nurse staffing based on the actual number of patients per nurse, as in the United States or Japan. It is also necessary to establish a reporting system for nurse staffing along with mandatory notification of nurse staffing levels. The United States introduced the payroll-based journal system in 2016 that enables the public to learn about nurse staffing. Section 6106 of the Affordable Care Act stipulates that nursing facilities for the elderly should report nurses' daily care hours (hours per resident day) on a quarterly basis for elderly patients and post on the Nursing Home Compare website information such as total nursing staff, turnover rate, nursing-sensitive patients' outcomes, and so on [52]. It is imperative for Korea to establish a system to report and notify the current status of nurse staffing in health and medical institutions in real time, allowing them to be benchmarked.

It is urgent to enact a Korean nursing law to stabilize supply and management of nurse staffing. Nursing and law studies are the main disciplines to engage to achieve patient health, well-being, and social justice. People in those disciplines can work concurrently when coordination or power differences erupt between members or organizations [53]. When nursing law originated in the mid-1900s, it described contracts, witnesses, and criminals; gradually, it developed into torts, confidentiality, and labor law and recently has focused on establishing nurses' roles/positions [53]. In particular, it focuses on establishing roles for each field and positions such as entry-level registered nurses, nurse practitioners or advanced practice nurses, manager, researcher, and so on [53]. The law could expand, maintain, or limit nursing clinics, education, and research [53].

The scope of practice, including the independent role of professional advance practice nurses, has expanded through legislation, case law, and regulatory changes [53].

In the United States, 14 states—California, New York, Massachusetts, Connecticut, Illinois, Nevada, Oregon, Rhode Island, Texas, Vermont, Washington, Ohio, New Jersey, and Minnesota—have enacted nursing laws, and legislation is being introduced in a

phased manner throughout the country. In total, 18 laws were enacted in these 14 states, and recently, the Safe Staffing for Nurse and Patient Safety Act of 2018, HR 5052 of Ohio and Quality Patient Care Act HF 2650 of Minnesota were proposed to the US House of Representatives and Senate, along with No. 989 from New Jersey to the US Senate. In addition, H.R. 2392 of California has been submitted to a committee, and D.B. S228 of New York and Ohio State's S.B.55 bill have been proposed to the Department of Health.

Conclusion

Proper nurse staffing is an important condition for the retention of nursing staff and patient safety. A review of nurse staffing laws, regulations, and regulatory devices in domestic and foreign countries revealed that Korea has adopted a very relaxed standard compared with the United States, Australia, Germany, and Japan. Korea's institutional devices are insufficient to ensure compliance with its nurse staffing laws. Therefore, we propose that a nurse staffing level should be identified on the basis of notification, and the penalties for health-care organizations that fail to meet the minimum standards should be enforced. Support for compliant institutions through the Staffing Grade Incentive System should also be strengthened, and the nursing fee system can improve by reinforcing disincentives for noncompliant institutions.

Furthermore, we propose institutional improvements to unify nurse staffing standards as the actual number of patients for each work shift per nurse, rather than the ratio of total nurses to the number of patients, reflecting the number of beds or bed-to-operation ratio, and publicizing the level. Currently, the Medical Service Act, staffing grades, and integrated nursing care system adopt different nurse staffing standards, thereby intensifying confusion among the public.

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Conflict of interest

No conflict of interest.

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