Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Changes in infection control policies and advancing infection control advanced practice nurse education in the Republic of Korea

Jeong Sil Choi RN, MPH, PhD, ICAPNa, Kyung Mi Kim RN, PhD, ICAPNb,*

a Gachon University College of Nursing, Incheon, South Korea
b Chungbuk National University Department of Nursing Science, Cheongju, South Korea

Key Words: Infection control Nurse Education

After the Middle East respiratory syndrome outbreak of 2015, the Korean government became the payer for infection control (IC) and prevention when hospitals developed IC offices and appointed IC doctors and IC advanced practice nurses. The goal was to enhance IC for all hospitalized patients to prevent the occurrence and spread of infection among them. Measures resulted in increased demand for IC personnel, especially IC advanced practice nurses. This study addressed changes in Korea’s IC policies and their impact on the IC advanced practice nursing education program.

Changes in Korea’s IC Policy

According to the medical law amendment of 2003, any Korean general hospital with more than 300 beds is required to have an IC committee responsible for the prevention of infection and an IC office to prevent health care–associated infections (HAI).1 However, the MERS outbreak that lasted from May to July 2015—in which 186 infected patients were confirmed and 36 patients died—created a crisis not only for the Korean medical system, but also for the Korean society in general. The MERS outbreak revealed problems in the medical delivery system, in the Korean medical quarantine system, and in the IC system in hospitals, resulting in Korean hospitals suffering substantial financial losses.2 Accordingly, the Korean government prepared and implemented strategies to support the establishment of the IC infrastructure in May 2016, by approving plans to revise measures concerning health insurance fees to promote prevention and prevent spread of HAIs.3 Korea’s national health insurance is public health insurance controlled and managed by the government.

In September 2016, the government started paying infection prevention and control fees to hospitals that carry out effective infection prevention and control activities. These hospitals accomplish this goal by using qualified personnel and the necessary facilities for the efficient operation of HAI control and prevention programs according to the revision of the Medical Care Payment Act.4 All hospitals with 150 or more beds were classified into grade 1 or 2, prescribed by the Ministry of Health and Welfare. To be classified as grade 1, the hospital must permanently employ 1 or more full-time IC nurses per 150 beds per quarter. Furthermore, the ratio of full-time IC nurses with at least 3 years’ experience in the IC office must be at least 500:1 with respect to the average number of beds, and at least 1 IC doctor per 300 beds must be employed. The IC doctor must be a full-time doctor who works in the IC office more than 20 hours per week, on average, and specializes in IC.

All personnel in the IC office must receive at least 16 hours of advanced training through government-recognized education programs each year. Hospitals that meet these criteria may receive additional funds after calculating the average costs between W 2,380 and W 2,870 (average of W2.4) for each hospitalized patient per day for grade 1,

* Address correspondence to Kyung Mi Kim, RN, PhD, ICAPN, Chungbuk National University Department of Nursing Science, Chungdae-ro 1, Seowon-Gu, Cheonju, Chungbuk 28644, South Korea.
E-mail address: scpkim@chungbuk.ac.kr (K.M. Kim).
Conflicts of interest: None to report.

https://doi.org/10.1016/j.ajic.2019.06.007
0196-6553/© 2019 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.
In 2004, the Korean government introduced a medical institution evaluation system for general hospitals and medical institutions with 300 or more beds with assessments conducted every 3 years. Medical law was revised in 2010 to improve patient safety and the quality of medical institution services, and medical institutions are reassessed for accreditation every 4 years. Although certifications were also required for elder care hospitals and psychiatric hospitals, acute care hospitals were required to apply for hospital accreditation at their discretion. Only about 12% of Korean hospitals had received hospital accreditation as of May 2014. Hospital accreditation did not directly link to a hospital's income. Also, hospitals have no clear incentive for receiving accreditation but must make infrastructure improvements to be eligible for accreditation. Hospital accreditation is an essential condition of payment from the government. Table 1 summarizes conditions for receiving payment for infection prevention and control.

### CHANGES IN DEMAND AND TRAINING CONDITIONS FOR ICAPN

In Korea, an advanced practice nurse (APN) is a nursing license holder with more than 3 years' practical experience in nursing practice in the last 10 years who completed the APN curriculum designated by the Ministry of Health and Welfare, and who passed the APN qualification examination conducted by the Ministry. Since the medical law amendment enactment in 2003, Korea had 14,449 APNs in 13 areas of expertise as of 2017. However, APNs generally do not practice in the field that matches their APN credentials. Further, the number of APN nurse applications is decreasing, perhaps owing to difficulty in predicting the demand for APNs, a lack of specificity in Korea’s insurance system, the absence of legal specifications on the role of APNs, a lack of employment opportunities in their area after qualification, and no changes in treatment or working conditions of nurses after obtaining APN certification.

### Table 1

Conditions for receiving payment for infection prevention and control

| IC Personnel | | |
| --- | --- | |
| 1) Grade 1: | | |
| (A) Full time ICN: a ratio of 150:1 or less compared with the average number of beds per quarter. | | |
| (B) Among the number of full-time ICNs meeting this condition, the ratio of the average number of nurses meeting any of the following conditions should be 500:1 or less: | | |
| (1) has an ICAPN certification. | | |
| (2) has more than 3 years’ experience in an IC office. | | |
| (C) IC doctors have a ratio of 300:1 or less compared with the average number of beds per quarter. | | |
| 2) Grade 2: | | |
| (A) Full-time ICN: a ratio of 200:1 or less compared with the average number of beds per quarter. | | |
| (B) Among full-time ICNs meeting this condition, the ratio of the average number of nurses meeting any of the following conditions should be 600:1 or less: | | |
| (1) has an ICAPN certification. | | |
| (2) has more than 3 years’ experience in an IC office. | | |
| (C) IC doctors have a ratio of 300:1 or less than the average number of beds per quarter. | | |
| Hospital accreditation | | |
| IC and control activities | | |
| - IC committee | | |
| - Training for all employees involved in IC more than once a year. | | |
| - Establishment of IC guidelines. | | |
| - Regular rounds and weekly recording concerning hospitals’ status on IC and improvement activities. | | |
| Participating in Korean National Healthcare-Associated Infections Surveillance | | |
| IC, infection control; ICAPN, Infection Control Advanced Practice Nurse; ICN, infection control nurse. | | |

and between $1,950 and $2,420 (average of $2) for grade 2. Also, to qualify for the infection prevention and control fees from the government, hospitals must obtain health care accreditation.

### Table 2

Current status of education institutions for caregivers specializing in infection control in 2019

| Name of graduate school | Quota (N = 60) | Year of establishment | Province |
| --- | --- | --- | --- |
| The Catholic University of Korea Graduate School of Clinical Nursing Science | 15 | 2004 | Seoul |
| Ulsan University Graduate School of Industry | 15 | 2004 | Seoul |
| Konyang University Graduate School of Nursing | 10 | 2009 | Daejeon |
| Busan National University Graduate School of Nursing | 5 | 2017 | Busan |
| Gachon University Graduate School of Nursing | 5 | 2017 | Incheon |
| Hallym University Graduate School of Nursing | 10 | 2019 | Gangwon |
| Total | 60 | | |

### Table 3

Subjects and credits of advanced infection control nursing curriculum (designated by the Korean Accreditation Board of Nursing Education)

| Categories | Subjects | Credits |
| --- | --- | --- |
| Common subject (mandatory) | Nursing theory | 2 |
| | Nursing research | 2 |
| | Advanced practice nursing | 2 |
| | Advanced health assessment (Theory 1, Practice 1) | 2 |
| | Pharmacology | 2 |
| Theoretical subjects (mandatory) | Pathophysiology | 2 |
| | Epidemiology and surveillance | >10 |
| | Clinical microbiology and immunology | |
| | Infectious disease | |
| | Basic principles of infection control and prevention practice | |
| | Infection prevention for practice settings and specialty care populations | |
| Clinical practicum | Infection control practice | >10 |
| | Clinical microbiology | |
| | Surveillance and outbreak investigation | |
| | Infection prevention for practice settings and service-specific patient care areas | |
| | Statistics | |
| Total | | >33 |
The addition of the required ICAPN certification to the conditions under which hospitals can receive infection prevention and control fees was after revision of the Medical Act in 2016, which resulted in increased demand for IC advanced practice nurses in hospitals and a marked increase in the number of nurses applying to the ICAPN program. Previously, 3 graduate schools offered ICAPN curriculums. The increase in applications resulted in 3 additional graduate schools being granted permission to open since 2017 (Table 2). Also, existing graduate schools increased their quota, more than doubling the number of students from 25 in the 3 graduate schools to 60 in the 6 graduate schools. Three graduate schools are operated by professors without ICAPN certification because of a shortage of professors with ICAPN certifications and because the government allows adjunct professors to teach courses.

A nursing professor, an infectious disease physician, a clinical microbiologist, an epidemiologist, and several IC nurses oversee the ICAPN graduate curriculum (Table 3). Ideally, a professor with ICAPN certification would be in charge of operating the curriculum effectively and qualitatively. Table 2 shows the ICAPN curriculum is only offered in certain parts of Korea, which means educational restrictions exist in the other regions. Therefore, nurses in other provinces must open such courses.

CONCLUSIONS

The enactment of the standard of payment for infection prevention and control—one of Korea’s major medical law revisions—required a particular IC advanced practice nurse ratio in hospitals, increasing the demand for IC nurses with ICAPN certification. Thus, the number of students applying for ICAPN certification and graduate schools offering master’s level certification have increased, leading to positive outcomes. The new law also meant nurses with ICAPN certification worked in IC departments of hospitals; previously, very few nurses worked in their certified field. These changes should contribute to the prevention and control of infection in hospitals by using competent IC advanced practice nurses who have been systematically trained and are performing IC tasks. However, because the ICAPN curriculum is a specialized field that has very different characteristics from other specialized nursing fields, it is essential that a full-time certified ICAPN professor be in charge of the ICAPN curriculum in graduate schools. Further, compensation toward an independent fund to recognize the contribution of IC advanced practice nurses professional nursing practices or professional practice license will help increase IC advanced practice nurses’ work satisfaction, and thus the number of nurses that graduate with ICAPN certification. To establish and operate these IC training programs efficiently, predictive studies are needed concerning future demand for ICAPN personnel. Additionally, the curriculum should be improved and standardized by identifying the educational needs of IC advanced practice nurses continuously, to address the emergence of new infectious diseases and the changing paradigm of the medical environment.

References

1. Kim KM, Jeong JS, Park HR. Infection control nurse specialist education in Korea. Am J Infect Control 2010;38:413-5.
2. Korea Accreditation Board of Nursing Education (2019). 2018 Korea advanced practice nurse annual report. Available from: http://www.kabaone.or.kr/HyAdmin/view.php?ss[sc]=1&ss[kw]=18F8FAC1B0%3A3BAXB5B0ED%BC%AD&bbs_id=Kab01&page=#&doc_num=561. Accessed February 5, 2019.
3. Kim KM, Choi J. Factors affecting core competencies among infection control nurses in Korea. Korean J Adult Nurs 2014;26:11-21.
4. Choi JS, Kim KM. Crisis prevention and management by infection control nurses during the Middle East respiratory coronavirus outbreak in Korea. Am J Infect Control 2016;44:480-1.
5. Ministry of Health and Welfare. Improve infection control of hospitals by establishing infection prevention and control fee. Available from: http://www.mohw.go.kr/react/jb/jsb0406ls.jsp?PAR_MENU_ID=04&MENU_ID=0403&CONT_SEQ=331514&page=1. Accessed February 2, 2019.
6. Ministry of Health and Welfare. Details on the criteria and method of application of medical care payment. Available from: http://www.mohw.go.kr/react/jb/jsb0406ls.jsp?PAR_MENU_ID=03&MENU_ID=030406&page=58#. Accessed February 2, 2019.
7. Korea Institute for Hospital Accreditation. Impact of healthcare accreditation using a systematic review: BSC (balanced score card) perspective. Available from: https://www.koiha.or.kr/member/kjr/board/rschReport/rschReport_BoardList.do. Accessed February 25, 2019.
8. Korea Institute for Hospital Accreditation. Activation plan for participation of hospital accreditation system. Available from: https://www.koiha.or.kr/member/kjr/board/rschReport/rschReport_BoardList.do. Accessed February 25, 2019.
9. Seol ME, Shin YA, Lim KC, Leem CS, Choi JH, Jeong JS. Current status and vitalizing strategies of advanced practice nurses in Korea. Persp Nurs Sci 2017;14:37-44.