

## Original Article

# International hospital accreditation and clinical nutrition service in acute care hospitals in South Korea: results of a nationwide cross-sectional survey

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**Background and Objectives:** Beginning in 2007, 29 hospitals in South Korea have received accreditation from Joint Commission International (JCI). The present study aimed to identify differences in clinical nutrition service provisions between JCI accredited acute care hospitals and non-accredited acute care hospitals. A survey questionnaire was sent to all 43 acute care hospitals in South Korea. **Methods:** A total of 35 sets of clinical nutrition service surveys, 234 sets of clinical dietitian job satisfaction surveys, and five-day daily work logs from 129 clinical dietitians were received. We used Fisher's exact test and independent t-test to analyze differences between acute care hospitals based on JCI accreditation. **Study Design:** Nationwide cross-sectional survey. **Results:** JCI accredited acute care hospitals (N=8) showed a higher, but not significantly higher, nutritional intervention rate of 12.7% among malnourished patients, compared with 7.0% in non-JCI accredited acute care hospitals (N=27). Analysis of work hours of clinical dietitians indicated time spent on direct care was higher ( $p<0.05$ ), while time spent on outpatient care was lower ( $p<0.05$ ) among JCI accredited acute care hospitals relative to non-JCI accredited acute care hospitals. **Conclusions:** Accreditation from JCI has a positive influence in the advancement of not only the hospital services, but also clinical nutrition services.

**Key Words:** clinical nutrition service, clinical dietitian, Joint Commission International (JCI) accreditation, acute care hospital, nutritional intervention rate

## INTRODUCTION

Hospital accreditation is not simply a system for improving existing assessments of health care institutions, but also has the ultimate goal of transforming a provider-centered medical culture to a consumer-centered system. Accreditors systematically survey all sectors of the health care service industry by applying new survey criteria and methods. Many benefits can be gained from the accreditation system, such as benefits from employee training accrued during the process of preparing for accreditation, which contributes to raise the standards of the medical institution.<sup>1</sup>

One of the representative accreditation systems is the Joint Commission International (JCI). JCI assesses the world's health care institutions and issues accreditation through a stringent evaluation of international standard medical services. It has the highest reliability among international hospital evaluations; for any institution to be accredited, it must undergo a thorough examination that includes 1,200 items in 14 categories, spanning the entire care practice, from the moment a patient enters the hospital to discharge. Due to its rigorous evaluation process, the international community recognizes JCI accreditation

as a global standard for medical services.<sup>2</sup>

Recently, many Korean hospitals have become interested in JCI accreditation. In 2007, for the first time in Korea, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) implemented evidence-based standardized measures of performance in a Severance hospital. By 2013, 39 hospitals were accredited. It is believed that this number has increased since this study was conducted. South Korea's own accreditation system began in 2011 with the Korea Institute for Healthcare Accreditation (KOIHA); one of the prerequisites for becoming an acute care hospital is KOIHA accreditation.<sup>3</sup> KOIHA has achieved positive outcomes, such as increasing awareness of patient safety, quality improvement among hospital workers, and facilitating

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employees to engage in related work.<sup>4</sup> As of March 2015, the number of KOIHA-accredited hospitals in South Korea was 896 (24.8%) out of a total of 3,607 hospitals.<sup>5</sup>

Previous foreign studies on accreditation have reported improved attitudes among health care workers and changes in various departments within organizations, and have also reported a positive impact on decision-making behavior and implementation of continued quality management programs and intra-hospital policies, with particular improvements in safety-related issues and the nursing department.<sup>6-10</sup> In Korea, it has also been reported that compliance with the JCI and KOIHA accreditation standards had a positive impact on quality improvement in medical services.<sup>4</sup> Therefore, accreditation itself is expected to positively influence clinical nutrition services, one of the accreditation evaluation categories, by serving as an ideal standard.

Clinical nutrition service in hospitals is defined as nutrition diagnosis and counselling services provided by clinical dietitians according to a physician's request, with the goal of disease management.<sup>11</sup> A growing body of research has shown that providing adequate nutrition services can prevent hospital readmission among the elderly and decrease the length of hospital stay in a number of patients.<sup>12,13</sup> In Korea, clinical nutrition services have become much more active under the KOIHA evaluation system. Pilot programs in the nutrition departments of major hospitals have been able to identify malnourished patients at an early stage, using the results of nutrition screening evaluations or malnourished patient screenings to provide nutritional planning and intervention to those patients and, when necessary, continued monitoring.<sup>2</sup> In a recent study by Kim et al,<sup>14</sup> a survey on the state of clinical nutrition services conducted in 20 acute care hospitals, 32 general hospitals, and 35 clinics in the Seoul area found that clinical nutrition services were actively implemented only in acute care hospitals and some general hospitals; however, all acute care hospitals were conducting nutrition screening, the most basic step in nutrition assessment. In a previous study,<sup>15</sup> it was reported that the major services provided by clinical dietitians were nutrition counselling and education, while nutrition screening and clinical nutrition services for malnourished patients, as well as meeting patients with the medical staff, were almost never performed. This result demonstrated that, although clinical nutrition services in Korea have advanced relative to services performed in the past, they are still far from adoption of clinical nutrition therapy into legislation as a part of medical care, as is the case in the United States.

As indicated, clinical nutrition services are part of the medical service and evaluation criteria for JCI and KOIHA accreditation, which include a section on patient nutrition care, leading to active implementation of clinical nutrition services. However, there have been no comparative analyses on the implementation rates of clinical nutrition services provided by JCI- or KOIHA-accredited acute care hospitals in South Korea.

As such, the objective of this study was to survey all acute care hospitals in South Korea, according to whether they were JCI-accredited, in order to identify the current state of clinical nutrition service implementation and job

satisfaction among clinical dietitians, as well as to conduct a time study of clinical dietitians in order to compare the implementation rates of clinical nutrition services between JCI-accredited acute care hospitals (n=8) and non-JCI-accredited acute care hospitals (n=27). JCI accreditation was chosen as the standard because it is more stringent than KOIHA accreditation. Based on these findings, this study further aimed to establish improvement measures for clinical nutrition services in South Korea by using the positive effects of JCI accreditation.

## MATERIALS AND METHODS

The study was approved by the Institutional Review Board at Pukyong National University (IRB: 1041386-20130912-HR-001-03 and IRB: 1041386-20131024-HR-002-03). This study included a clinical nutrition service survey and a job satisfaction survey of clinical dietitians from all 43 acute care hospitals in South Korea. Both surveys were collected via postal mail. Time study questionnaires were administered to clinical dietitians or dietitians being trained for internship in order to document the jobs they performed throughout the day. The return rate of the clinical nutrition service survey questionnaires was 81.4% (35 acute care hospitals), and 234 sets of job satisfaction questionnaires and work analysis logs from 129 respondents (over a course of five days) were retrieved, all of which were used in the statistical analyses. This was a cross-sectional survey conducted from September 15 through October 15, 2013.

### *Clinical nutrition service*

Clinical nutrition service questionnaire items were based on previous studies<sup>16,17</sup> and constructed with advice from experts. The questionnaire items were largely divided into two categories of general hospital and clinical nutrition tasks. General hospital tasks were defined as those related to general work in the hospital and the nutrition department, while clinical nutrition tasks were defined as those related to nutrition management of inpatients, inpatient malnutrition status' for one month, and post-management issues related to malnourished patients.

### *Job satisfaction level*

The job satisfaction questionnaire contained 27 items and was developed with tools used in previous studies,<sup>18,19</sup> with supplementary revisions made to suit this study's objective to determine job satisfaction among clinical dietitians. The questionnaire included task-related, stability/vision, working conditions, and relationship items. Each item was measured on a five-points Likert scale, with one point indicating "not at all" to five points indicating "very much" Moreover, eight items related to the need to improve the quality of clinical nutrition services were presented, from which five items were to be selected.

### *Detailed working time study of clinical dietitians*

The questionnaire for the working time study of clinical dietitians was developed using the clinical dietitian staffing guidelines presented in the Clinical Staffing Needs Assessment Manual;<sup>20</sup> a supplementary revision process by experts made it applicable for use in South Korea. To measure the time spent on work according to the Nutri-

**Table 1.** General characteristics of acute care hospitals

| Variables  | JCI accredited<br>(n=8) | Non-JCI accredited<br>(n=27) | Total<br>(n=35) | p-value |
|--|-------------------------|------------------------------|-----------------|---------|
| Beds   | 1189±435 <sup>†</sup>   | 1035±458                     | 1071±451        | 0.135   |
| Occupancy rate, % <sup>‡</sup>                   | 98.8±3.1                | 98.1±4.8                     | 98.3±4.4        | 0.516   |
| Number of inpatients/day                         | 1574±577                | 801±665                      | 955±727         | 0.007** |
| Number of outpatients/day                        | 4623±196                | 3477±229                     | 3640±230        | 0.025*  |
| Computerized nutritional screening system, n (%) |                         |                              |                 |         |
| Yes  | 8 (100)                 | 27 (100)                     | 35 (100)        | -       |
| No   | -                       | -                            | -               | -       |
| Food service type, n (%)                         |                         |                              |                 |         |
| Contracted                                       | 6 (75.0)                | 11 (40.7)                    | 17 (48.6)       | 0.121   |
| Self-operated                                    | 2 (25.0)                | 16 (59.3)                    | 18 (51.4)       |         |

JCI: Joint Commission International.

Values are mean±SD or n (%) for 35 hospitals. Values were analyzed by the independent t-test or Fisher's exact test. Different letters indicate significant differences (\*\* $p<0.01$ ) between JCI and non-JCI accreditation.

<sup>†</sup>Mean±SD.

<sup>‡</sup>Occupancy rate (%): number of patients divided by the number of available beds.

tion Care Level of inpatients, Nutrition Care Level evaluation sheets were used, which were developed from the Nutrition Status Classification Worksheet as a reference, and which underwent supplementary revision by experts to make it applicable for use in South Korea. For the clinical nutrition task activities time survey, the job standards for clinical nutrition tasks were created based on the job standards developed in a study by Cha et al<sup>21</sup> with appropriate supplementation and revisions. The standards were divided into a total of five management tasks, consisting of general care, indirect care, direct care, outpatient care, and food-service management, which were then subdivided into a total of 22 tasks. Records were logged every 10 min during weekdays (five days), and the overall time required for clinical nutrition services was calculated.

#### Data analysis

The results from the clinical nutrition service, time study of clinical dietitians, and clinical dietitian job satisfaction surveys were processed using SPSS version 21.0 software (SPSS Inc, Chicago, IL, USA), and descriptive analyses was performed with frequency, percentage, mean, and standard deviation. For items related to the need for quality improvement in clinical nutrition service, five of eight items were selected, and their frequencies and percentages were calculated. The analysis of differences based on JCI and KOIHA accreditation was conducted via  $\chi^2$  or Fisher's exact test, independent t-test, and one-way ANOVA analysis.

## RESULTS

### General characteristics of acute care hospitals

The characteristics of acute hospitals surveyed are presented in Table 1. The results indicated that, overall, JCI-accredited and non-JCI-accredited hospitals did show a significant difference in the number of inpatients/day and outpatients/day ( $p<0.05$ ).

### General characteristics of clinical dietitians in acute care hospitals

Survey results indicated that most dietitians were younger women with a Master's degree or higher, and that most dietitians were certified, regardless of JCI accreditation.

Clinical dietitians in non-JCI-accredited hospitals had longer tenures than those in non-accredited hospitals (data not shown).

### Clinical nutrition services in acute care hospitals

Regardless of JCI accreditation, the average nutrition screening rate was 92.0%, average malnutrition detection rate was 20.0%, and average nutritional intervention rate was 8.3%. The average nutrition record documentation rate was 85.7%, and the average monitoring and reassessment rate was 65.7%. In addition, there was a high percentage ( $\geq 85\%$ ) of actively operating nutrition support teams (NSTs) in both groups (Table 2).

### A detailed working time study of clinical dietitians

For all clinical dietitians, the average work day was approximately 9.7 h (584 min). Among the five tasks of clinical dietitians (general care, indirect care, direct care, outpatient care, and food-service management), more time was spent on direct care (average 145 min) and food-service management (average 115 min) in JCI-accredited acute care hospitals relative to non-JCI accredited acute care hospitals, while more time was spent on general care, indirect care, and outpatient care in non-JCI-accredited acute care hospitals relative to JCI-accredited hospitals. In particular, significantly more time was spent on meal rounds, a general care subtask, in JCI-accredited acute care hospitals, with an average of 18 min, compared with 4 min in non-JCI-accredited acute care hospitals ( $p<0.001$ ). Among the subtasks under direct care, a significant difference was observed in nutrition diagnosis, with JCI-accredited acute care hospitals reporting an average of 45 min of work versus an average of 22 min of work in non-JCI-accredited acute care hospitals ( $p<0.05$ ). In outpatient care, an average of 26 min was spent on nutrition counselling in JCI-accredited acute care hospitals relative to an average of 53 min in non-JCI-accredited acute care hospitals ( $p<0.05$ ; Table 3).

### Number of clinical dietitians per 100 beds

Regardless of JCI accreditation, the average number of clinical dietitians per 100 beds was 0.75, with most clinical dietitian manpower being allocated to inpatient man-

**Table 2.** Clinical nutrition services in acute care hospitals

| Variables                                      | JCI accredited<br>(n=8) | Non-JCI accredited<br>(n=27) | Total<br>(n=35) | p-value |
|--|-------------------------|------------------------------|-----------------|---------|
| Nutrition screening rate (%)                   | 97.6±3.3 <sup>†</sup>   | 90.4±24.8                    | 92.0±21.9       | 0.165   |
| Malnutrition detection rate (%) <sup>‡</sup>   | 14.4±10.5               | 21.6±18.1                    | 20.0±16.8       | 0.248   |
| Nutritional intervention rate (%) <sup>§</sup> | 12.7±11.1               | 7.0±5.4                      | 8.3±7.3         | 0.194   |
| Nutrition record documentation, n (%)          |                         |                              |                 |         |
| Yes  | 8 (100)                 | 22 (81.5)                    | 30 (85.7)       | 0.315   |
| No   | -                       | 5 (18.5)                     | 5 (14.3)        |         |
| Monitoring and reassessment, n (%)             |                         |                              |                 |         |
| Yes  | 6 (75.0)                | 17 (63.0)                    | 23 (65.7)       | 0.685   |
| No   | 2 (25.0)                | 10 (37.0)                    | 12 (34.3)       |         |
| NST in hospital, n (%)                         | 8 (100)                 | 27 (100)                     |                 |         |
| NST actively operating, n (%)                  |                         |                              |                 |         |
| Yes  | 7 (87.5)                | 24 (88.9)                    | 31 (88.6)       | 1.000   |
| No   | 1 (12.5)                | 3 (11.1)                     | 4 (11.4)        |         |

JCI: Joint Commission International; NST: Nutrition Support Team.

Values are mean±SD or n (%) for 35 hospitals. Values were analyzed by the independent t-test or Fisher's exact test. Different letters indicate significant differences ( $p < 0.05$ ) between JCI and non-JCI accreditation.

<sup>†</sup>Mean±SD.

<sup>‡</sup>Malnutrition detection rate: the number of malnourished patients divided by nutrition screening.

<sup>§</sup>Nutritional intervention rate: the number of patients in nutrition intervention divided by nutrition screening.

agement (0.40), followed, in order, by food-service management (0.25) and outpatient care (0.10). In particular, a significantly greater amount of outpatient care manpower was allocated in non-JCI-accredited acute care hospitals (0.14) than it was in JCI-accredited acute care hospitals (0.06) ( $p < 0.05$ ) (Table 4).

#### Job satisfaction level

The level of reported job satisfaction among clinical dietitians working in acute care hospitals, regardless of JCI accreditation, was higher than three of five possible points, indicating a somewhat high job satisfaction level. Among the four categories (task, stability/vision, working conditions, and relationships), JCI-accredited acute care hospitals reported the same or similar averages in three categories compared with non-JCI hospitals, with the exception of task. More specifically, three items, "I'd like to keep working as a clinical dietitian," "I receive fair job performance evaluation," and "My boss understands my job well," received significantly higher scores in JCI-accredited acute care hospitals than they did in non-JCI accredited acute care hospitals ( $p < 0.05$ ). Meanwhile, on the salary satisfaction item, clinical dietitians in JCI-accredited acute care hospitals showed significantly lower scores than did those in non-JCI-accredited acute care hospitals (3.6 points vs 4.3 points) ( $p < 0.001$ ) (data not shown).

#### Areas for improvement for clinical dietitians' tasks

Regardless of JCI accreditation, the item that was said to require the most improvement among all eight items was the shortage of dietitians (82.9%), followed, in order, by insufficient communication with medical staff (77.4%), low- or no-fee counselling and education (70.5%), heavy task load (62.8%), little opportunity for self-development (57.7%), the ratio of regular to non-regular employees (57.3%), unstable employment status (45.7%), and communication with administrative staff (19.2%) (data not shown).

#### DISCUSSION

This study was meaningful, as it was the first to survey the overall state of clinical nutrition services in the 43 acute care hospitals throughout South Korea. Moreover, this study also explored legislation and policy measures needed to enable Korea's clinical nutrition services to become more active, which was done by distinguishing JCI-accredited acute care hospitals from non-JCI-accredited acute care hospitals and analyzing the results of the clinical nutrition service survey, a time study of clinical dietitians, and job satisfaction.

Although the eight JCI-accredited acute care hospitals were not significantly different from the non-JCI accredited acute care hospitals with respect to number of beds, occupancy rate, and outpatients/day, the results did show that inpatients/day were approximately two-fold higher in JCI-accredited hospitals relative to non-JCI accredited hospitals. This is believed to be due to patients in South Korea flocking to larger hospitals, especially acute care hospitals, that provide services for patients with severe illnesses, regardless of the severity of their own disease.<sup>22</sup> Even outpatients with mild symptoms selected larger hospitals, despite an increase in deductibles.<sup>23</sup> Therefore, it is easily understandable that, among all acute care hospitals in Korea with high medical service standards, JCI-accredited acute care hospitals that have been recognized as having world-class medical services would have a higher number of outpatients than would non-JCI-accredited acute care hospitals. JCI and KOIHA recommend that nutrition evaluation be performed within 24h of admission to manage nutritional risks of inpatients at the onset of their hospital stay.<sup>24,25</sup> According to these results, 100% of acute care hospitals were equipped with computerized nutritional screening systems for timely nutrition screening of inpatients to allow for quick nutrition evaluations.

Our study results indicate that 48.6% of acute care hospitals, regardless of JCI accreditation, were contract-managed. Although this rate is lower than the self-

**Table 3.** A detailed working time analysis of clinical dietitians working in acute care hospitals

| Work   | JCI accredited<br>(n=51) | Non-JCI accredited<br>(n=78) | p-value  |
|--|--------------------------|------------------------------|----------|
| Working time (min/day)                         | 586±58.9                 | 582±58.0                     | 0.695    |
| General care (inpatient)                       |                          |                              |          |
| Nutrition screening and rescreening            | 12.6±24.6                | 23.0±40.6                    | 0.105    |
| High-risk patient management                   | 23.1±44.8                | 27.7±52.0                    | 0.590    |
| Explaining therapeutic diet                    | 13.2±19.0                | 26.8±61.3                    | 0.071    |
| Meal rounds                                    | 18.0±27.6                | 4.1±10.0                     | 0.000*** |
| Total  | 69.3±84.7                | 81.5±92.1                    | 0.441    |
| Indirect care                                  |                          |                              |          |
| Daily activities <sup>†</sup>                  | 67.5±49.1                | 56.0±49.9                    | 0.198    |
| Team rounds                                    | 16.7±36.9                | 9.0±22.8                     | 0.144    |
| Student training                               | 5.3±13.9                 | 5.0±12.9                     | 0.910    |
| Group patient care education                   | 11.6±22.8                | 16.9±35.7                    | 0.305    |
| Indirect care activities                       | 60.7±51.6                | 65.3±67.2                    | 0.664    |
| Non-patient care time                          | 59.7±24.4                | 68.0±34.3                    | 0.137    |
| Lunch time                                     | 34.0±20.4                | 35.3±17.7                    | 0.702    |
| Other  | 6.7±21.7                 | 9.6±26.1                     | 0.484    |
| Total  | 223±85.8                 | 232±114                      | 0.656    |
| Direct care (inpatient)                        |                          |                              |          |
| Nutrition assessment                           | 22.9±23.5                | 26.2±32.4                    | 0.534    |
| Nutrition diagnosis                            | 45.4±92.1                | 21.6±27.1                    | 0.047*   |
| Nutrition education and counseling and support | 60.8±50.6                | 45.4±52.1                    | 0.114    |
| Monitoring and evaluation                      | 7.4±12.5                 | 12.6±32.1                    | 0.228    |
| Case management-related duties                 | 5.5±11.1                 | 9.5±20.7                     | 0.221    |
| Other  | 4.8±16.5                 | 5.1±17.2                     | 0.916    |
| Total  | 145±114                  | 101±111                      | 0.032*   |
| Outpatient care                                |                          |                              |          |
| Nutrition counseling                           | 25.7±41.9                | 52.6±86.4                    | 0.040*   |
| Additional care                                | 6.2±18.1                 | 8.7±32.5                     | 0.572    |
| Other  | 4.7±11.5                 | 18.5±45.9                    | 0.038*   |
| Total  | 33.9±48.9                | 79.6±124                     | 0.013*   |
| Food service management                        |                          |                              |          |
| Therapeutic diet food service                  | 27.7±46.4                | 15.4±37.1                    | 0.099    |
| General diet food service                      | 87.6±93.9                | 73.1±143                     | 0.490    |
| Total  | 115±113                  | 88.7±155                     | 0.269    |

JCI: Joint Commission International.

Values are mean±SD for 129 clinical dietitians. Values were analyzed by the independent t-test. Different letters indicate significant differences (\* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.001$ ) between JCI and non-JCI accreditation.

<sup>†</sup>Daily activities: Checking patient lists and generating computer reports; planning work; discussions about workload and assignments with clinical nutrition staff, including providing updates related to days off, weekend coverage, and/or patient transfers; email and correspondence; telephone calls unrelated to patient care.

**Table 4.** Number of clinical dietitians per 100 beds in acute care hospitals

| Variables   | JCI accredited<br>(n=8) | Non-JCI accredited<br>(n=27) | Total<br>(n=35) | p-value |
|---|-------------------------|------------------------------|-----------------|---------|
| Total number of clinical dietitians                     | 8.2±3.51                | 8.3±6.6                      | 8.3±5.1         | 0.966   |
| Number of clinical dietitians per 100beds               | 0.69±0.20               | 0.80±0.25                    | 0.75±0.3        | 0.196   |
| Inpatient clinical dietitians per 100beds               | 0.43±0.18               | 0.36±0.15                    | 0.40±0.17       | 0.303   |
| Outpatient clinical dietitians per 100beds              | 0.06±0.05               | 0.14±0.11                    | 0.10±0.08       | 0.017*  |
| Food service management clinical dietitians per 100beds | 0.20±0.17               | 0.30±0.18                    | 0.25±0.8        | 0.214   |

JCI: Joint Commission International.

Data shown exclude contract-managed dietitians.

Values are mean±SD for 35 hospitals. Values were analyzed by the independent t-test. Different letters indicate significant differences (\* $p<0.05$ ) between JCI and non-JCI accreditation.

operated rate (51.4%), it represents a greater than two-fold increase from 18.9% 10 years earlier.<sup>26</sup> In a 1992 hospital commission survey conducted in the United States, 45.4% of the ~1,090 hospitals surveyed were contract-managed, and it was reported that there was an increase in contract management due to the trend of Total Quality Management (TQM).<sup>27</sup> The reasons for choosing in-hospital contract management in Korea were to simpli-

fy the administrative workload of the hospital; to simplify overall management by commissioning dietitians and care center labor costs, accounting for food ingredients and consumables, and administrative management related to human resources.<sup>28</sup> The reasons for using in-hospital contract management in the United States were found to be specialized competitiveness of the commissioned firm and the commissioned company's purchasing power

for specialized equipment and bulk purchases.<sup>29</sup>

It has been reported that clinical dietitians with greater experience use this clinical experience to make their job tasks more systematic and advanced.<sup>30</sup> Given this, it is believed that the higher rate of irregular clinical dietitians in their 20s with less experience in JCI-accredited acute care hospitals can lead to a shortage of clinical dietitians with clinical experience. In the future, this may contribute to JCI-accredited acute care hospitals having a lower quality of inpatient clinical nutrition services relative to non-JCI-accredited acute care hospitals.

A survey of the education levels of clinical dietitians in acute care hospitals indicated that 64.9% had Master's degrees or higher, which is greater than the 31.5% in general hospitals reported in a previous study. The rate of certified clinical dietitians was approximately 90%, over 25% higher than the 64.7% in general hospitals previously reported.<sup>30</sup> In South Korea, in an effort to enhance the quality of clinical nutrition services, the Ministry of Health and Welfare became responsible for the national licensing of clinical dietitians in 2012, which is expected to produce more Master's-level clinical dietitians<sup>31</sup> and thus increase future numbers of certified clinical dietitians with Master's degrees.

As a result of investigating the implementation stages of clinical nutrition service in acute care hospitals, regardless of JCI accreditation, high nutrition screening rates of greater than 90% were seen. Meanwhile, the average malnutrition detection rates in JCI- and non-JCI-accredited acute care hospitals were 14.4% and 21.6%, respectively. In order to identify malnourished patients, hospitals use nutritional screening and assessment tools. Malnutrition has been associated with higher rates of complications,<sup>32,33</sup> increased nosocomial infections, higher hospital costs,<sup>32,34</sup> higher mortality,<sup>32,35</sup> and longer length of hospital stay (LOS).<sup>32,36</sup> A number of nutritional screening and assessment tools have been developed to assess nutritional risk.<sup>37-39</sup> Standard tools that have been developed with recognized validity include the Subjective Global Assessment (SGA), Patient-Generated Subjective Global Assessment (PG-SGA), and Nutrition Risk Screening 2002 (NRS 2002). In Korea, although the development of nutritional screening and assessment tools for nutrition screening has progressed to a certain degree,<sup>40-42</sup> each hospital uses various tools, depending on its own situation, rather than using standardized nutritional screening and assessment tools.<sup>43</sup> The results of this survey also indicate that nutrition screening and assessment tools developed in-house were used, and while JCI-accredited acute care hospitals used subjective nutrition screening and assessment tools that included appetite change and weight change, non-JCI-accredited acute care hospitals used more biochemical nutrition screening and assessment tools that measured total lymphocytes, albumin, etc. As a result of this, each hospital would be expected to show a different malnutrition detection rate.

The average nutrition intervention rate, which reflects clinical nutrition services being provided to malnourished patients by clinical dietitians, was 12.7% in JCI-accredited acute care hospitals, which was higher than the 7.0% observed in non-JCI-accredited acute care hospitals. In other words, JCI-accredited acute care hospitals con-

ducted nutrition interventions with 90% of patients with detected malnutrition, whereas non-JCI-accredited acute care hospitals did so with approximately 30% of all patients with detected malnutrition. Based on these results, different implementation rates in clinical nutrition services can be seen, even in acute hospitals that provide the highest quality medical services in South Korea, regardless of JCI accreditation; the positive impact of JCI accreditation was also observed.

In addition, JCI-accredited acute care hospitals, which consider follow-up important, reported higher nutrition record documentation, monitoring, and reassessment rates than did non-JCI-accredited acute care hospitals. Regarding NST active operations, irrespective of JCI accreditation, at least 80% were actively operating. NST refers to a team of experts from a minimum of four different professions, such as physicians, nurses, pharmacists, and dietitians, operating to provide the most appropriate nutrition therapy needed for inpatients.<sup>44</sup> Unlike the results-oriented KOIHA accreditation, JCI accreditation, which consists of a process-oriented evaluation system, mentions that healthcare organizations are continually required to monitor structures, processes, and outcomes. However, these survey results found that NST activities were not being continuously performed 100% of the time. In other words, the continuous follow-up program of JCI accreditation was not being completed. Therefore, since both JCI and KOIHA reaccredit hospitals every 3 years, some hospitals might perform medical services just to pass the accreditation evaluation process.

The analysis results for the one-day average time study, extracted from the five-day time study survey of clinical dietitians, found that, regardless of JCI accreditation, the average number of office hours for clinical dietitians was approximately 9.7 h (including a 1-h lunch break). For clinical dietitians in JCI-accredited acute care hospitals, direct care corresponding to inpatient care took an average of 145 min, which was higher than the average of 101 min reported in non-JCI-accredited acute care hospitals. Within direct care work, nutrition diagnosis required almost twice as much time in JCI-accredited acute care hospitals than it did in non-JCI-accredited acute care hospitals.

The American Dietetic Association, starting in early 2003, adopted the standardized nutrition care process (NCP) model with four standardized steps (nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation) to present a systematic process for providing professional nutrition care.<sup>45</sup> Among these steps, nutrition diagnosis is a key element of the NCP, which involves identification of nutrition-related issues that can be resolved or improved upon by an independent intervention by a clinical dietitian, separate from medical diagnosis, and contributions to medical therapy outcomes can be made by resolving the diagnosed nutrition issue.<sup>46-48</sup> Direct care work in this study was surveyed by applying the NCP; the fact that more time was spent on nutrition diagnosis, which often involves critically ill patients and requires considerable thought by clinical dietitians, was encouraging. Among the subtasks of general care, the average time spent on meal rounds was higher in JCI-accredited hospitals (18.0

min compared with 4.1 min in non-JCI-accredited acute care hospitals;  $p < 0.001$ ). In South Korea, meal round is work related to feeding patients and consists of clinical dietitians following upon complaints or details of meals provided to inpatients. In contract-managed cases, contract-managed dietitians conduct meal rounding. The reason that JCI-accredited hospitals spent more time on meal rounds, despite having a higher contract-management rate, was due to the evaluation criteria specified in the JCI accreditation. Whereas KOIHA presents guidelines around providing therapeutic meals on the basis of precautionary measures, JCI provides a broad range of nutrition education to the patients and their families, including potential interactions between prescribed medications and food, diet, and nutrition. Moreover, nutrition-related criteria within JCI also stipulate that patients must be given a variety of options when choosing their meals. Outpatient care took approximately half the time in JCI-accredited acute care hospitals than it did in non-JCI-accredited acute care hospitals. Although the number of outpatients/day was higher in JCI-accredited acute care hospitals, time taken in providing outpatient clinical nutrition services was lower, indicating a pattern of greater emphasis on inpatient clinical nutrition services during the work day. This is believed to be a positive outcome attributed to JCI accreditation that oversees safety and quality of inpatient medical services.

Regardless of JCI accreditation, results of calculating the clinical dietitian manpower involved in performing clinical nutrition services showed an average of 0.75 persons per 100 beds. This represents clinical nutrition services being performed at approximately 50% of the manpower of the reported 1.33–1.54 persons per 100 beds for clinical dietitians in the United States,<sup>49</sup> but was the same as the study results from 20 years earlier, which reported 0.8 clinical dietitians per 100 beds.<sup>50</sup> This could be one of the largest factors preventing active implementation of clinical nutrition services in South Korea. In particular, the average outpatient care manpower in JCI-accredited acute care hospitals was significantly lower (0.06 per 100 beds compared with 0.14 in non-JCI-accredited acute care hospitals;  $p < 0.05$ ). This demonstrated that JCI-accredited acute care hospitals, despite having less clinical dietitian manpower than non-JCI-accredited acute care hospitals, focused more on inpatient care, a factor considered important for JCI accreditation, rather than on outpatient nutrition counselling, which is more profitable. It further demonstrated that clinical dietitians in JCI-accredited acute care hospitals were doing their best to provide medical services that comply with JCI standards, despite having low manpower.

In the survey of clinical dietitian job satisfaction, clinical dietitians in JCI-accredited acute care hospitals reported significantly lower job satisfaction than did those working in non-JCI-accredited acute care hospitals on the items, “my job is stable” and “I am satisfied with my salary,” which were subcategories under the stability/vision and working conditions. These findings are thought to have been influenced by JCI-accredited acute care hospitals’ having more temporary clinical dietitians than stable clinical dietitians, despite performing more inpatient care than do non-JCI-accredited acute care hospitals. For the

items, “I’d like to keep working as a clinical dietitian,” “my boss understands my job well,” and “I receive fair job performance evaluations,” JCI-accredited acute care hospitals reported significantly higher satisfaction than did non-JCI accredited acute care hospitals, from which it can be surmised that work in JCI-accredited acute care hospitals is better organized, a result of the positive impact of JCI accreditation.

As a result of surveying areas needing improvement for clinical dietitians to actively conduct clinical nutrition services, regardless of JCI accreditation, the shortage of dietitians (82.9%) ranked first, followed by insufficient communication with medical staff (77.4%). This was consistent with the results of a previous study by Jang et al.,<sup>51</sup> and these are problems that must be addressed in Korea’s acute care hospitals, regardless of JCI accreditation. Today, acute care hospitals have the best clinical nutrition service performance record in Korea, but the quality of clinical nutrition service may suffer in the future due to the shortage of clinical dietitians. A recent study from the United States reported that registered dietitians spent 77% of their time on direct care activities and 23% of time on indirect care activities.<sup>52</sup> However, our study results indicated that the daily activities of dietitians in acute care hospitals in Korea consisted of 30% for general care and indirect care corresponding to inpatient care, while other activities, such as indirect care, outpatient care, and food-service management, took up 70% of their time. In the United States, the primary task of clinical dietitians is to engage in direct counselling of patients, but JCI accreditation requires a large indirect workload of paperwork, meetings, etc., creating overtime for clinical dietitians,<sup>52</sup> with clinical dietitians in Korea facing an even greater amount of indirect workload. With JCI-accredited hospitals requiring more time for patient care than non-accredited hospitals, the present study did observe the positive impact of JCI accreditation. However, this positive impact may not be sustainable, since JCI and KOIHA accreditations increase the workload associated with indirect care, and Korea has a fundamental shortage of clinical dietitians that is more severe than in the United States. Therefore, in order to emphasize the positive impact of accreditation programs and to make them more active, legislation at the national level regarding proper staffing of clinical dietitians must be established first, and KOIHA must be improved upon by using JCI accreditation as the model in order to actively improve nutritional intervention rates and NST activities.

This study was the first clinical nutrition service survey and time study survey conducted, according to the NCP process of acute care hospitals, throughout South Korea. Moreover, it was meaningful in that it compared acute care hospitals according to JCI accreditation, and it identified the positive aspects of JCI accreditation and factors that hinder the advancement of clinical nutrition services in Korea.

Our study limitations include the fact that the sample size of JCI-accredited acute care hospitals was small. In addition, because many of the hospitals used nutritional screening and assessment tools developed in-house, the malnutrition detection rate varied. In addition, since the number of clinical dietitians performing clinical nutrition

services was different for each hospital, time spent on work also varied. Future studies should use standardized nutritional screening and assessment tools, along with fixed quantitative standards for clinical dietitians when conducting a clinical nutrition service survey and analyzing daily time commitments of clinical dietitians.

In conclusion, to date, JCI-accredited acute care hospitals have done well in providing inpatient clinical nutrition services with less manpower relative to non-JCI-accredited acute care hospitals. However, before attempting to obtain accreditation, the following must be improved to maintain the quality of clinical nutrition services: 1) clinical dietitian staffing; 2) active operation of NSTs through communication with medical staff; 3) accreditation standards, based on JCI standards that suit the needs of South Korea; and 4) establishing continuous follow-up programs until reaccreditation.

#### AUTHOR DISCLOSURES

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