A Study on the Necessity of Medical Facilities Safety Design Adoption

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Abstract. [Purpose] The purpose of this study was to investigate the requirements of the introduction of a safety design and certification system for medical facilities. [Subjects] A survey was carried out of one hundred nurses, physical therapists, occupational therapists, speech and language therapists from May to August in 2012. [Methods] The survey was conducted after giving subjects some information about safety design. [Results] The participants were aware of the need for establishing a safety design certification system. Total responses to services, facilities and space were analyzed in order to evaluate the priorities of safety, user characteristics, functionality, convenience and aesthetics. Regarding the application of a safety design certification system to services, items were prioritized in the order of children’s items, household supplies and hospital supplies. For facilities, the priorities were, living space, social welfare and medical facilities; space, they were public and transportation-related places. The requirements for operating a safety design system were in order development of: highly skilled manpower, the legal system, educational promotion and qualifying facilities. [Conclusion] In conclusion, in order to implement safety design in medical facilities, a safety design certification system should be introduced first, and to do this a systematic and comprehensive study is needed.

Key words: Safety design, Safety design certification, Medical facilities

INTRODUCTION

All patients and their families want to receive treatment in a safe environment(7). In the U.S., attention to the safety of patients is given much attention, and an accreditation system approves the safety of medical institutions at an international level. The assessment of the health care environment and level id performed by the Joint Commission International (JCI), a sub-agency of the Joint Commission of Accreditation of Health Organization(3). Four hospitals have passed the JCI assessment in Korea(3).

The safety incident rate in Korea remains in the lower ranks of OECD countries. The proportion of deaths due to safety incidents is 12.4%, two times higher than the 5.9% average of OECD countries(3). The safety incident rate has not decreased over the last 10 years, and it has been one of the biggest stumbling blocks to Korea joining the ranks of advanced countries. Many accidents both large and small occur repeatedly, with huge property and financial losses annually, but fundamental safety measures have not yet been introduced. Also, the percentage of persons with disabilities due to safety incidents has not been reduced(3).

In general, safety is understood as the contrary concept of risk, and the degree of risk factor elimination is considered the degree of safety. Safety design is defined as improving the level of social safety through synergistic fusion of with other feature. Safety is achieved through the incorporation of safety design in products, facilities, space, design, manufacturing, construction and operation, etc(5). A patient-safety culture is one which creates a safe and high quality healthcare environment by taking measures to prevent or reduce risk, as well as on which actively seeks out potential hazards(6).

It is essential to introduce of safety design in medical institutions to prevent safety incidents, and to reduce medical costs and additional problems that result from accidents. In this study, we investigated the requirements for the introduction of a safety design certification system for medical institutions and healthcare workers as a way of applying safety design to the medical facilities.

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SUBJECTS AND METHODS

A survey was carried out of one hundred of healthcare workers from May to August in 2012. The participants of the survey were nurses, physical therapists, occupational therapists, speech and language therapists. Before the survey was conducted, an explanation of safety design was given. The contents surveyed were the general characteristics of the subjects, the requirement of safety in design, the priority of the evaluation safety design, the requirement for establishing a safety design certification system and their of priority. Excepting incomplete responses from the survey data of 100, the responses of 98 questionnaires were analyzed using the SPSS 18.0 statistical program.

RESULTS

The characteristics of the subjects who participated in the survey are shown in Table 1. The subjects were 59 females (60.2%) and 39 males (39.8%); 21 were in their 20s (21.4%), 33 were in their 30s (33.7%), 41 were in their 40s (41.8%) and 3 were in their 50s (3.1%). The results for length of service in the hospital were; 27 people with less than five years (27.6%), 41 with 5 to 10 years (41.8%), 18 with 10 to 15 years (18.4%), 12 with 15 to 20 years (12.2%). 31 nurses (31.6%), 29 physical therapists (29.6%), 25 occupational therapists (25.5%), and 13 speech and language therapists (13.3%).

Regarding the need for establishing a safety design and certification system, the safety design of services was recognized the highest by 72.4% of respondents, the safety design of space by 67.4%, the safety design of for the facilities by 64.0%. The need of establishing a safety design certification system was recognized by 69 (70.4%) (Table 2).

In the responses to the priority of the evaluation the safety design, the safety services was placed first, and for space, user characteristics were given priority. The overall response to prioritization of services, facilities and space were safety, user characteristics, functionality, convenience and aesthetics in that order (Table 3).

Regarding the application of a safety design certification...
system, services, the children’s items, household and hospital given the highest priorities, and in the case of space, public and transportation-related spaces were given the highest priorities (Table 4).

For the implementation of a safety design operating system, the highest requirements were the development of: highly skilled manpower (46.9%), followed by the legal system (19.4%), education (17.4%), and the certification of facilities (Table 5).

**DISCUSSION**

The Occupation Safety and Health Act of Korea currently covers the management of safety in the healthcare facilities. It regulates the assessment of the environment of medical facilities, and the education and management of the workers in healthcare those facilities. Even though discussion safety in terms of health, the concept of safety-design is not well understood in Korea. Consideration of the safety of the users as well as workers in healthcare facilities should be done together. The WHO emphasized the importance of safety design in medical facilities. It is essential to introduce safety design to medical institutions to prevent accidents in order to, reduce medical costs and additional problems arising from accidents. The results of this study suggest the need to introduce a safety design certification system for medical institutions and healthcare workers by applying safety design to medical facilities. Present safety certification and safety design certification are the S mark certification of Korea Occupational Safety & Health Agency, the CE mark certification of Europe, and the ISO Certification System. The safety design certification suggested by the results of this study are an ergonomic evaluation based on user’s characteristics and safety certification by safety standards.

The subjects were 59 females (60.2%) and 39 males (39.8%). Their distribution across professions was: 31 nurses (31.6%), 29 physical therapists (29.6%), 25 occupational therapists (25.5%), and 13 speech and language therapists (13.3%). Regarding the need to establish a safety design and certification system, the need for safety design of the services was recognized as the by 72.4% of respondents, followed by safety design of space (67.4%) and safety design facilities (64.0%). The necessity of establishing a safety design certification system was recognized by 69 people (70.4%). This result shows the workers who are working in health care facilities recognize the need for safety design and its effect, and they think a certification system should be prepared. The responses about the priority of evaluation for safety design, indicate safety should given first given priority for services facilities, and user characteristics should be given priority in the case of space. The overall responses to services, facilities and the space were; safety, user characteristics, functionality, convenience and aesthetics in that order. It indicates that the focus of safety design should be on safety and the user, in other words, the patients and workers in medical facilities and the nature of healthcare facilities. For the application of a safety design certification system, services, children’s items, household and hospital were given the highest priorities. Regarding facilities, living space, social welfare and medical facilities were given the highest, priorities, and in the case of space, public and transportation-related spaces were given the highest priorities. The needs for operating a safety design system were identified as the development of: highly skilled manpower, by 46.9% of the respondents, the legal system (19.4%), educational promotion (17.4%), and certification facilities (16.3%). The highly skilled manpower needed to certify safety design and requires comprehensive knowledge and experience about safety, human engineering, design, and usability evaluation. Therefore, the introduction of a qualification system and the operation of a training program is needed in order to train them. For educational promotion, management of risks to the safety of patients and workers in medical facilities, an administrative system, such as a safety design certification system, and continuous promotion and education should be provided together. In other words, if the patients and workers in medical facilities are not aware of safety design, the policies or strategies such as a safety design certification system would be invalidated.

The concept of safety design goes beyond simply ensuring the safety of all the essential concepts in the field of design, and it should be applied to the services and, facili-

| Table 4. Priorities for the implementation of a safety design and certificate system |
|-----------------------------------------------|
| Category                        | Frequency (%) |
| Services                        |               |
| Children Services               | 36 (36.8)     |
| Daily Life Services             | 22 (22.4)     |
| Hospital Service                | 22 (22.4)     |
| Welfare Service for the Aged    | 8 (8.2)       |
| Handicap Service                | 5 (5.1)       |
| Home Appliance                  | 5 (5.1)       |
| Total                           | 98 (100)      |
| Facility                        |               |
| Amenity                         | 23 (23.5)     |
| Welfare Facility                | 21 (21.4)     |
| Medical Facility                | 21 (21.4)     |
| Educational Facility            | 13 (13.3)     |
| Manufacturing and Service Facility| 12 (12.2)   |
| Recreation Facility             | 8 (8.2)       |
| Total                           | 98 (100)      |
| Space                           |               |
| Public                          | 29 (29.6)     |
| Traffic Space                   | 26 (26.5)     |
| Infrastructure                  | 22 (22.5)     |
| Mass Media                      | 21 (21.4)     |
| Total                           | 98 (100)      |

| Table 5. Requirements for operation of a safety design system |
|-----------------------------------------------|
| Category                        | Frequency (%) |
| Specialists                     | 46 (46.9)     |
| Legal System                    | 19 (19.4)     |
| Education and Information       | 17 (17.4)     |
| Certification Facility          | 16 (16.3)     |
ties over the entire space of human life. The safety design of medical facilities cannot ensure safety only by meeting safety standards. In our social reality of low safety levels, the establishment of a safety design certification system should be considered ahead of other instruments in medical facilities. Because most workers in the medical facilities agree on the need for the introduction of safety design and a certification system, continuous research will be needed to lay the groundwork for the safety design of health care facilities and the introduction of a certification system.

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