

Near Misses Experienced at a University Hospital in Korea

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Abstract

Objectives: This study aimed to investigate how many healthcare professionals experienced near misses, what types of near misses occurred most often, and healthcare professionals' opinions about near misses at one university hospital in Korea.

Methods: The authors developed a questionnaire including 26 core types of near misses and 4 questions about preventability and reporting barriers. The survey was conducted from Oct. 31st to Nov. 18th 2011, about 3 weeks, using a self-administrated questionnaire that was administered to 697 healthcare professionals (registered nurses, pharmacists, technicians, and nurses aides) who worked at a university hospital. Medical doctors and employees working in the department of administration were excluded.

Results: About half of hospital workers experienced at least one or more near misses during the past one year. The drug dispensing process was the most common subcategory of near misses. Among the 26 items, patient falls was highest. Over 95% of respondents reported that the near miss they experienced was preventable. Also, more than half of respondents did not report the near miss and the main reason for omission was fear of blame.

Conclusion: Regarding patient safety issues, a near miss is a very significant factor because it can be a potential adverse event. Therefore, we should grasp the size of the problem through tracking and analyzing near misses and should make an effort to reduce them. To do so, we should check whether our reporting system is well designed and functioning.

Key words

Near misses, Adverse events, Patient safety,
Health professionals, Reporting system

I. Introduction

“To error is human”, the monumental report published in 1999 by the Institute of Medicine (IOM), was the tipping point regarding the patient safety movement[1,2]. After publishing the report, patient safety issues such as adverse events and medical errors have captured increasing attention from not only medical experts but the media and the general population[3]. In particular, considerable research regarding adverse events has been conducted across the world[4–8]. Recently, however, it has been suggested that near miss-based analysis is much more meaningful than concentrating on an adverse event itself, as the industrial field does[9]. According to Heinrich’s law, for every major injury (or adverse event), there are 30 minor injuries and 300 near misses[10]. Near miss is potential adverse event that was identified before it caused injury, illness, or damage to the patient[7]. Thus, to prevent future adverse events, systems should be improved appropriately through tracking and analyzing near misses[11]. That is, a near miss can function as an early warning system for preventing adverse events or medical errors[12]. For this reason, considerable research regarding near misses has been performed[12–16]. In addition, some countries such as the USA, Canada, and UK have established national reporting systems to manage patient safety[17] and they make an effort to reduce not only adverse events, but also near misses[18]. Particularly, in the USA, hospi-

tals should report near misses and adverse events to the Agency for Healthcare Research and Quality (AHRQ) [19]. The Joint Commission provides standards and universal protocols to prevent errors that can occur at medical institutes[20].

However, in the case of Korea, little is known about the current status of near misses and adverse events in healthcare organizations. This study aimed to investigate how many healthcare professionals working at one hospital experienced near misses, what types of near misses mainly occurred, and healthcare professionals’ opinions about preventability and reporting barriers of near misses they have experienced.

II. Materials and Methods

1. Questionnaire development

After reviewing the relevant literature[4–6, 14–19,21,22], two main parts were chosen as a basis for the questionnaire. The first part regarded what types of near misses occurred during the last one year. The authors divided possible near misses into two categories: operation (surgical) and non-operation (non-surgical)-related near misses. Operation-related near misses included one subcategory (surgical procedures; 6 types) and non-operation-related near misses consisted of 5 subcategories: drug dispensing (5 types), drug administration (5 types), patient protection (4 types), radiological and laboratorial exams (5 types), and

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Table 1. Summary of the final questionnaire

Category	Subcategory	Question
Operation-related near misses	Surgical procedure	During the past one year, have you ever experienced the following near misses: (1) Preventing a surgery from being performed on the wrong body part in a patient (2) Preventing a surgery from being performed on a wrong patient (3) Preventing a wrong surgical procedure from being performed on a patient (4) Detecting unintended retention of a foreign object in a patient after operation or other procedure (5) Preventing operation-related infection resulting from the use of contaminated drugs, devices, or biologics provided by the healthcare facility during pre-op or intra-op (6) Preventing a burn that almost happened to a patient during pre-op or intra-op
Non-operation-related near misses	Drug-dispensing process	During the past one year, have you ever experienced the following near misses: (1) Detecting a wrongly or incorrectly prescribed drug during review of a doctor's order (2) Detecting a problem on conveying a doctor's prescription (3) Detecting a problem during the process of compounding a drug (4) Detecting a wrongly or incorrectly compounded drug (5) Detecting late delivery of a drug to a ward or nursing station
	Drug administering process	During the past one year, have you ever experienced the following near misses: (1) Detecting a wrong medicine prescribed before administering (2) Detecting a wrong route before administering (3) Detecting a wrong dosage before administering (4) Detecting a wrong patient before administering (5) Detecting a wrong time before administering
	Patient protection	During the past one year, have you ever experienced the following near misses: (1) Preventing a patient fall (2) Preventing a patient burn (3) Preventing a pressure ulcer (4) Preventing a patient suicide
	Radiology/Laboratory	During the past one year, have you ever experienced the following near misses: (1) Detecting a problem during the exam process (2) Delaying a diagnostic or laboratorial exam (3) Detecting a late response after performing an exam (4) Detecting a missing radiological or diagnostic exam (5) Detecting a problem in reporting exam results
	Transfusion	During the past one year, have you ever experienced the following near misses: (1) Preventing transfusion of ABO/HLA-incompatible blood or blood products
Opinions about preventability and reporting of near misses	Preventability	How preventable was the near miss that you experienced?
	Contributing factor	What was the most important contributing factor of the near miss you experienced?
	Reporting of near misses	Did you report to your boss or senior when the near miss occurred? If not, why?

pre-op: preoperative

HLA : Human Leukocyte Antigen

blood transfusion (1 type). Patient protection was constructed by modifying the contents of the AHRQ Patient Safety Event Report[19]. The second part regarded opinions about preventability and reporting barriers of near misses that the hospital workers experienced. Participants were asked about preventability, contributing factors, whether the near miss was reported or not, and if not, the reason why they did not report. Table 1 shows the 26 core types of near misses and the 4 questions about preventability and reporting barriers among all questions except general characteristics such as sex, age, job classification, and working area.

2. Survey

There were a total of 697 healthcare professionals who were eligible for participation, including 4 types of healthcare professionals (registered nurses (RNs), pharmacists, technicians, and nurses' aides (NAs)) who were working at a university hospital. Medical doctors and employees working in the department of administration were excluded. The survey was conducted from Oct. 31st to Nov. 18th 2011, about 3 weeks, using a self-administered questionnaire. We asked participants to answer the questions based on their experience during the past one year (from Nov. 1st 2010 to Nov. 1st 2011). Also, respondents were asked to check all types of near misses that they experienced. Thus, theoretically, one employee could have checked all 26 items of near misses,

Lastly, regarding the questions about contributing factors and reporting of near misses, multiple responses were allowed.

3. Statistical methods

Response rates according to job classification and working areas were calculated and all frequencies on each question also were displayed by job classification. We conducted a Pearson's chi-square test to identify any differences among healthcare professionals such as RNs, pharmacists, technicians, and NAs. The PASW statistical software package (version 18.0 K for Windows; SPSS Inc., Chicago) was used to perform all statistical analyses. All statistical tests were two-sided and a p-value <0.05 was considered statistically significant.

4. Ethics statement

This study was exempted from approval by the Institutional Review Board of Seoul National University Boramae Medical Center (IRB No. 07-2015-13).

III. Results

1. Response rate

Among the 697 eligible hospital employees, a total of 432 healthcare professionals participated in the survey (overall response rate:

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62.0%). The response rates by job classification were different; RNs were highest (66.6%, 323 out of 485), followed by technicians (66.3%, 63 out of 95), pharmacists (44.5%, 10 out of 22), and NAs (37.9%, 36 out of 95) ($p < 0.05$). According to working area, the response rate of employees who were working in departments of radiology

and laboratory was highest (81.8%, 54 out of 66), followed by the outpatient care units (78.7%, 70 out of 89), special care units (70.9%, 139 out of 196), inpatient general care units (50.3%, 158 out of 314), and department of pharmacy (34.4%, 11 out of 34) ($p < 0.05$) (Table 2).

Table 2. The survey response rate according to job classification and working areas

Category	Total	Answer (%)	The number of workers by job classification* (%)				The number of workers who experienced a near miss	
			Registered Nurses	Pharmacists	Technicians	Nurses Aides		
Total	697		485 (69.6)	22 (3.2)	95 (13.6)	95 (13.6)		
Answer (%)		432 (62.0)	323 (66.6)	10 (45.5)	63 (66.3)	36 (37.9)		
The number of workers who experienced a near miss			174 (53.9)	7 (70.0)	29 (46.0)	2 (5.6)	212 (49.1)	
The number of employees by working area (%)	Inpatient general care unit	314 (45.1)	158 (36.6)	158 (48.9)	NA	NA	NA	91 (57.6)
	Outpatient care unit	89 (12.8)	70 (16.2)	26 (8.1)	NA	12 (19.1)	32 (88.9)	17 (24.3)
	Special care unit	196 (28.1)	139 (32.2)	139 (43.0)	NA	NA	NA	73 (52.5)
	Department of pharmacy	32 (4.6)	11 (2.6)	NA	10 (100)	NA	1 (2.8)	7 (63.6)
	Department of radiology & laboratory	66 (9.5)	54 (12.5)	NA	NA	51 (81.0)	3 (8.3)	24 (44.4)

* $p < 0.05$

2. What types of near misses mainly occurred?

1) Overall description about types of near misses

Among the 432 participants, 212 healthcare professionals (49.1%) reported that they experienced at least 976 cases of near misses among 26 types of near misses during the last one year. According to job classification, the rate of experience was highest in pharmacists (70.0%, 7 out of 10), followed by RNs

(53.9%, 174 out of 323), technicians (46.0%, 29 out of 63), and NAs (5.6%, 2 out of 36) ($p < 0.05$). According to working areas, employees who were working in a department of pharmacy experienced the highest level of near misses (63.6%, 7 out of 11), followed by the inpatient general care unit (57.6%, 91 out of 158), special care unit (52.5%, 73 out of 139), departments of radiology and laboratory (44.4%, 24 out of 54), and outpatient care unit (24.3%, 17 out of 70) (Table 2). The most common subcategory of near misses

related to the drug dispensing process (328 reports from 123 employees), followed by radiology and laboratory exams (211 reports from 84 employees), patient protection (203 reports from 130 employees), drug administration process (199 reports from 84 employees), surgical procedures (29 reports from 20 employees), and transfusion (6 reports from 6 employees). Among each 26 types of near misses, the most common types were preventing patient falls (120 workers) and finding wrongly or incorrectly prescribed drugs during review of doctors' orders (110 workers) (Table 3).

2) Operation-related near miss

Questions for operation-related near misses were only for RNs because other professionals in this study were not relevant to operation. 20 RNs experienced 29 cases among 6 types of near misses. Prevention of operation-related infection was most common (10 reports), followed by preventing unintended retention of a foreign object (8 reports), identifying the wrong body part before surgery (5 reports), and identifying the wrong surgical procedure before it was performed (5 reports) (Table 3).

3) Non-operation related near miss

A. Dispensing drug process

The dispensing drug process was relevant to some RNs and pharmacists because the pro-

cess begins with the doctor's prescription and finishes with the delivery of the drug to a ward or nursing station. 123 employees (116 RNs and 7 pharmacists) reported 328 cases of near misses. The most common near miss during the drug dispensing process was finding wrongly or incorrectly prescribed drugs while reviewing doctors' orders (110 reports), followed by finding wrongly or incorrectly compounded drugs (78 reports), and finding the mistake on conveying the doctor's prescription (75 reports) (Table 3).

B. Administering drug process

There were 84 RNs who experienced 199 near misses during the administering process. The most common type was preventing administration of wrong medicine that was not prescribed by doctors (57 reports), followed by finding a wrong dosage of medicine (46 reports) and finding wrong time (34 reports), wrong patient (33 reports), and wrong route (29 reports) (Table 3).

C. Patient protection

All professionals except pharmacists answered that they experienced this type of near miss. 130 respondents experienced 203 cases of near misses. The most common type of near miss was preventing patient falls (120 reports), followed by preventing pressure ulcers (63 reports), preventing burns (12 reports), and preventing patient suicides (8 reports) (Table 3).

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Table 3. Types of near misses experienced by hospital workers[†]

Category	The number of types of near misses	Total number of hospital workers who experienced a near miss	The number of workers by job classification (%)			
			Registered Nurses	Pharmacists	Technicians	Nurses Aides
Total number of people who experienced a near miss		212	174(82.1)	7(3.3)	29(13.7)	2(1.0)
Total number of types of near misses	976					
Total number of operation-related near misses	29					
Surgical procedures	29					
Actual number of workers who experienced a near miss		20(9.4)	20(5.7)	NA	NA	NA
Wrong body part		5(2.4)	5(2.9)	NA	NA	NA
Wrong patient		0	0	NA	NA	NA
Wrong surgical procedure		5(2.4)	5(2.9)	NA	NA	NA
Unintended retention of a foreign object		8(3.8)	8(4.6)	NA	NA	NA
Operation-related infection		10(4.7)	10(5.8)	NA	NA	NA
Operation-related burn		1(0.5)	1(0.6)	NA	NA	NA
Total number of non-operation-related near misses	947					
Drug dispensing process	328					
Actual number of workers who experienced a near miss		123(58.2)	116(66.6)	7(100)	NA	0
Finding wrongly or incorrectly prescribed drugs during review of a doctor's order		110(51.9)	103(59.2)	7(100)	NA	NA
Finding a mistake on conveying a doctor's prescription		75(35.4)	70(40.2)	5(71.4)	NA	NA
Finding a mistake on compounding a drug		5(2.4)	NA	5(71.4)	NA	NA
Finding a wrongly or incorrectly compounded drug		78(36.8)	73(42.0)	5(71.4)	NA	NA
Finding late dispensing of a drug		60(28.3)	56(32.2)	4(57.1)	NA	NA
Drug administering process	199					
Actual number of workers who experienced a near miss		84(39.6)	84(48.3)	NA	NA	NA
Wrong prescribed medicine		57(26.9)	57(32.8)	NA	NA	NA
Wrong route		29(13.7)	29(16.7)	NA	NA	NA
Wrong dosage		46(21.7)	46(26.4)	NA	NA	NA
Wrong patient		33(15.6)	33(19.0)	NA	NA	NA
Wrong time		34(16.0)	34(19.5)	NA	NA	NA
Patient protection	203					
Actual number of workers who experienced a near miss		130(61.3)	108(62.0)	NA	20(69.0)	2(100)
Patient fall		120(56.6)	98(56.3)	NA	20(69.0)	2(100)
Patient burn		12(5.7)	8(4.6)	NA	4(13.8)	0
Pressure ulcer		63(29.7)	63(36.2)	NA	0	0
Suicide prevention		8(3.8)	8(4.6)	NA	0	0

Category	The number of types of near misses	Total number of hospital workers who experienced a near miss	The number of workers by job classification (%)			
			Registered Nurses	Pharmacists	Technicians	Nurses Aides
Radiology & laboratory	211					
Actual number of workers who experienced a near miss		84(39.6)	60(71.4)	NA	24(28.6)	NA
Detecting a problem during the exam process		51(24.1)	30(17.3)	NA	21(72.4)	NA
Delaying a diagnostic or laboratorial exam		65(30.7)	44(25.3)	NA	21(72.4)	NA
Detecting a late response after performing an exam		30(14.2)	23(13.2)	NA	7(24.1)	NA
Missing a radiological or diagnostic exam		37(17.5)	25(14.4)	NA	12(41.4)	NA
Detecting problems in reporting exam results		28(13.2)	20(11.5)	NA	8(27.6)	NA
Transfusion	6					
Actual number of workers who experienced a near miss		6(2.8)	6(100)	NA	NA	NA
Preventing transfusion of ABO/HLA-incompatible blood or blood products		6(2.8)	6(3.5)	NA	NA	NA

*p <0.05, **p <0.001

† The question permitted multiple responses.

D. Radiology & laboratory

In radiology & laboratory, 84 respondents (60 RNs and 24 technicians) answered that they experienced 211 cases of near misses. The most common type was delaying a diagnostic exam (65 reports), followed by problems during the exam process (51 reports), missing the diagnostic exam (37 reports), missing the follow-up on exam results (30 reports), and missing the report of the exam results (28 reports) (Table 3).

E. Transfusion

There were 6 RNs who answered that they experienced preventing transfusion of ABO/HLA-incompatible blood or blood products (Table 3).

3. Opinions regarding preventability and reporting of near misses

We asked about preventability, contributing factors, whether the near miss was reported to or not, and if not, the reason why it was not reported. Regarding preventability of near misses that respondents experienced, 96.2% of respondents answered almost certainly (44.3%) or likely (51.9%) that they could have been prevented. Three major contributing factors were individual human factors (36.3%), communication problems (34.9%), and hospital system or policy problems (33.5%). In the case of confronting near misses, 43.9% of respondents did not report to their boss or senior. The most common reason for not reporting was “the fear of blame” (36.6%), followed by “unclear what types of events should be reported” (19.4%), “because of no hazard to the patient” (15.1%), and “concerns about bad evaluation from supervisor or boss” (13.9%) (Table 4).

Table 4. Opinions regarding preventability and reporting of near misses

Category	Total	Registered Nurses	Pharmacists	Technicians	Assistant Nurses
Total	212	174	7	29	2
How preventable was the near miss that you experienced?					
Almost certainly could have been prevented	94(44.3)	71(40.8)	4(57.2)	17(58.6)	2(100)
Likely could have been prevented	110(51.9)	96(55.2)	3(42.9)	11(37.9)	0
Likely could not have been prevented	6(2.8)	5(2.9)	0	1(3.5)	0
Almost certainly could not have been prevented	2(1.0)	2(1.2)	0	0	0
What was the most important contributing factor to the near miss you experienced?					
Hospital system or policy problem	71(33.5)	54(31.0)	3(42.9)	13(44.8)	(100)
Lack of staff qualification competence (e.g., qualifications, experience)	58(27.8)	49(28.7)	2(28.6)	7(24.1)	0
Lack of staff training	57(26.9)	47(22.2)	2(28.6)	7(24.1)	1(100)
Supervision or support problem	7(3.3)	6(3.5)	0	1(3.5)	0
Environmental factor (physical surroundings— e.g., lighting, noise)	17(8.0)	13(7.5)	1(14.3)	3(10.4)	0
Communication problems (supervisor to staff, among staff or team members, staff to patient or family)	74(34.9)	65(37.4)	1(14.3)	8(27.6)	0
Individual human factors (fatigue, stress, inattention, cognitive factors, health issues)	77(36.3)	64(36.8)	6(85.7)	6(20.7)	1(100)
Did you report to your boss or senior when the near miss occurred?					
Yes	119(56.1)	96(55.2)	6(85.7)	15(51.7)	2(100)
No	93(43.9)	78(44.8)	1(14.3)	14((48.3)	0
If not, why?					
Concerns about bad evaluation from supervisor or boss	13(13.9)	13(16.7)	0	0	0
Fear of blame	34(36.6)	32(41.0)	1(100)	1(7.1)	0
Concerns about relations with other departments	2(2.2)	0	0	2(14.3)	0
Difficulty writing a report	8(8.6)	4(5.1)	0	4(28.5)	0
Unclear what types of events should be reported	18(19.4)	13(16.7)	0	5(35.7)	0
Concern that the mistake would be recorded	3(3.2)	3(3.8)	0	0	0
Because there was no hazard to the patient	14(15.1)	12(15.4)	0	2(14.3)	0
Missing the appropriate time to report	1(1.1)	1(1.3)	0	0	0

† The question permitted multiple responses.

IV. Discussion

The purpose of this study was to explore how many healthcare professionals working at a university hospital experienced near misses, what types of near misses occurred most often, and healthcare professionals' opinions regarding near misses at one university hospital setting in Korea. As a result of this survey, we confirmed that about half of hospital workers experienced at least one or more near misses during the past one year. In particular, the drug dispensing process was reported as the most common subcategory of near miss. Among 26 subtypes of near misses, preventing patient falls was highest. Over 95% of respondents answered that the near miss they experienced was preventable. Also, they recognized that individual human factors, communication problems, and hospital system factors similarly contributed to the occurrence of near misses. Lastly, more than half of respondents did not report the near miss and the main reason for omission was due to fear of blame. According to our results, 49.1% of hospital workers (212 out of 432) experienced at least 976 cases of near misses. If we directly apply the Heinrich's law, theoretically, 3,25 cases of major injury and 98 cases of minor injury might have occurred during the past one year. Also, the most common type of near miss was regarding patient falls. Among the 6 subcategories, the dispensing drug process showed the highest level of near misses. According to several studies[16,23], medication-relat-

ed near misses were the most common. In our study, also, the number of drug-related near misses (527 cases), including the dispensing drug process (328 cases) and administering drug process (199 cases), occupied 54.0% of the total near misses (976 cases).

It is remarkable that more than 95% of respondents recognized that the near misses they experienced were preventable. Inversely, there were non-preventable near misses less than 5% of the time. Ultimately, reducing preventable near misses can decrease the possibility of adverse events. What should be done for reducing near misses? Controlling contributing factors of near misses could be a good starting point. Respondents in this study recognized that human factors, communication problems, and hospital system or policy problems similarly contributed to near misses. Therefore, we should make an effort to decrease these factors affecting near misses. That is, to reduce human factors related to near misses, guaranteeing safe working condition (i.e., simplifying and standardizing procedures and banning overtime work) could be essential. Also, to improve staff communication, hospitals should make consistent rules and apply identical communication methods among healthcare professionals[23]. To do so, the system should be appropriately designed to prevent communication errors. For example, in the case of a doctor's verbal prescription order using the phone, RNs who receive the order from the doctor should write down, read back, and confirm the order. In sum, to reduce near misses, hu-

man factors and communication problems should be controlled through a systemic approach. To analyze the cause of near misses and to make a better system, voluntary reporting should be done without hiding the event. In our study, only 56.1% of respondents reported near misses to their boss. Even though our results showed a relatively higher reporting rate than other studies[24–26], the fact that about half of workers did not report near misses can result in serious systemic failures. To prevent systemic failures, reporting must be encouraged through achieving a culture of safety and learning[15]. The reasons why healthcare workers do not report incidents might be complex. According to one research study, there were some barriers to reporting, such as fear of blame, sense of failure, skepticism of the benefits of reporting, fear of reprisals, lack of trust in the organization, difficulty in reporting the incident or lack of time, benefits of reporting are unclear, and perceived risk of civil litigation[15]. As noted, the fear of blame was the main reason not to report in our study. It may be because errors are considered human errors under a punitive culture rather than systematic errors; thus, when errors occur, individuals will be blamed and must take responsibility for the error[24]. Establishing a non-punitive climate might reduce the fear of reporting and encourage more open communication regarding patient safety[27]. Lastly, we should check whether our reporting system is well designed and functioning. The system should be non-punitive, confidential, independent, timely, system-oriented,

responsive, and based on expert analysis[28].

There are some limitations in this study. First, this study explored the current status of near misses through a self-administered survey. Therefore, respondents might under-report their near misses and recall bias might occur. Second, we could not grasp the real number of near misses because they were not based on patients' chart review and we did not investigate near misses from medical doctors. Lastly, the results in this study were from just one university hospital setting so it might not represent other healthcare settings.

V. Conclusion

Our study showed that about half of hospital workers experienced at least one or more near misses during the past one year and over 95% of near misses could be prevented. However, more than half of respondents did not report the near miss and the main reason for omission was due to fear of blame. In patient safety issues, near misses are a very significant factor because they can be a potential adverse event identified before it results in harm to the patient. Therefore, we should grasp the size of the problem through tracking and analyzing near misses and should make an effort to reduce them. To do so, we should check whether our reporting system is well-designed and functioning. In addition, we should make an effort to establish a non-punitive climate and encourage more open communication regarding patient safety.

VI. References

1. Kohn L, Corrigan J, Donaldson M et al. *To err is human: building a safer health system; Report from the Committee on Quality of Health Care in America for the Institute of Medicine*. Washington, U.S.: National Academies Press, 1999.
2. Pronovost PJ, Holzmueller CG, Ennen CS, Fox HE. Overview of progress in patient safety. *American J of Obstetrics and Gynecol* 2011;204(1):5–10.
3. Florea A, Caughey SS, Westland J, Berckmans M, Kennelly C, Beach C, et al. The Ottawa Hospital Quality Incident Notification System for Capturing Adverse Events in Obstetrics. *J of Obstetrics and Gynaecology Canada* 2010;32(7):657–62.
4. Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG, et al. Incidence of Adverse Events and Negligence in Hospitalized Patients: Results of the Harvard Medical Practice Study I. *Quality Safety Health Care* 2004;13(2):145–51.
5. Leape LL, Brennan TA, Laird N, Lawthers AG, Localio AR, Barnes BA, et al. The nature of adverse events in hospitalized patients: Results of the Harvard Medical Practice Study II. *New England J of Medicine* 1991;324(6):377–84.
6. Thomas EJ, Studdert DM, Burstin HR, Orav EJ, Zeena T, Williams EJ, et al. Incidence and types of adverse events and negligent care in Utah and Colorado. *Medical Care* 2000;38(3):261–71.
7. Friedman SM, Provan D, Moore S, Hanneman K. Errors, near misses and adverse events in the emergency department: what can patients tell us?. *Canadian J of Emergency Medicine* 2008;10(5):421–7.
8. de Vries EN, Ramrattan MA, Smorenburg SM, Gouma DJ, Boermeester MA. The incidence and nature of in-hospital adverse events: a systematic review. *Quality & Safety in Health Care* 2008; 17(3):216–23.
9. Tanaka K, Otsubo T, Tanaka M, Kaku A, Nishinoue N, Takanao T, et al. Similarity in predictors between near miss and adverse event among Japanese nurses working at teaching hospitals. *Industrial Health* 2010; 48(6):775–82.
10. Heinrich HW. *Industrial Accident Prevention: A Scientific Approach*. New York, NY: McGraw-Hill, 1950.
11. Reason J. *Human Error*. New York, NY: Cambridge University Press, 1990.
12. Cohoon B. Causes of Near Misses: Perceptions of Perioperative Nurses *AORN J* 2011;93(5):551–65.
13. Guffey P, Szolnoki J, Caldwell J, Polaner D. Design and implementation of a near-miss reporting system at a large, academic pediatric anesthesia department. *Paediatr Anaesth* 2011; 21(7):810–4.
14. Bilimoria KY, Kmiecik TE, DaRosa DA, Halverson A, Eskandari MK, Bell RH Jr, et al. Development of an online morbidity, mortality, and near-miss reporting system to identify patterns of adverse events in surgical patients. *Archives of Surgery* 2009;144(4):305–11.
15. Bird D. Patient safety: improving incident reporting. *Nurs Stand* 2006;20(14–16):43–6.
16. Currie LM, Desjardins KS, Stone PW, Lai TY,

Near Misses Experienced at a University Hospital in Korea

- Schwartz E, Schnall R, et al. Near-miss and hazard reporting: promoting mindfulness in patient safety education. *Studies in Health Technology and Informatics* 2007;129(Pt. 1):285–90.
17. Downie J, Lahey W, Ford D, Gibson E, Thomson M, Ward T, et al. Patient Safety Law: From Silos to Systems Final Report. [Internet]. Dalhousie University. 2006 [cited 2013 April 15]. Available from: [http://hli.law.dal.ca/Files/Patient_Safety_-_Main_Report_\(final\).pdf](http://hli.law.dal.ca/Files/Patient_Safety_-_Main_Report_(final).pdf)
18. World Health Organization. World Alliance for Patient Safety: WHO Draft Guidelines for Adverse Event Reporting and Learning Systems. Switzerland: WHO, 2005, 37–48.
19. AHRQ. Patient Safety Event Report–Hospital: SUMMARY OF INITIAL REPORT (SIR). U.S. [cited 2013 Apr 15]. Available from: [file:///C:/Users/13zd/Downloads/Summary%20of%20Initial%20Report%20\(SIR\)%20Form-CFV1.2.pdf](file:///C:/Users/13zd/Downloads/Summary%20of%20Initial%20Report%20(SIR)%20Form-CFV1.2.pdf)
20. The Joint Commission [Internet]. U.S. [cited 2013 Apr 15]. Available from: http://www.jointcommission.org/standards_information/up.aspx
21. Nadzam DM. Development of medication-use indicators by the Joint Commission on Accreditation of Healthcare Organizations. *American J Hospital Pharmacy* 1991;48(9):1925–30.
22. Espin S, Wickson-Griffiths A, Wilson M, Lingard L. To report or not to report: a descriptive study exploring ICU nurses' perceptions of error and error reporting. *Intensive & Critical Care Nursing* 2010;26(1):1–9.
23. Healey MA, Shackford SR, Osler TM, Rogers FB, Burns E. Complications in surgical patients. *Archives of Surgery* 2002;137(5):611–7.
24. Kim J, An K, Kim MK, Yoon SH. Nurses' Perception of Error Reporting and Patient Safety Culture in Korea. *Western J of Nursing Research* 2007;29(7):827–44.
25. Barach P, Small S. Reporting and Preventing Medical Mishaps: Lessons from Non-Medical Near Miss Reporting Systems. *BMJ* 2000;320(7237):759–63.
26. Joshi MS, Anderson JF, Marwaha S. A Systems Approach to Improving Error Reporting. *J of Healthcare Information Management* 2002;16(1):40–5.
27. Tuttle D, Holloway R, Baird T, Sheehan B, Skelton WK. Electronic Reporting to Improve Patient Safety. *Quality & safety in health care* 2004; 13(4):281–6.
28. Leape LL. Reporting of Adverse Events. *New England J of Medicine* 2002;347(20):1633–8.

부록: 설문 문항

I. Near Miss 관련

Near Miss(근접오류): 근접오류는 위해를 끼칠 수 있었으나 우연히 또는 시스템 내부에 있는 과정이나 어떤 사람이 막았기 때문에 위해를 끼치지 않은 것

1. 지난 1년 귀하가 속한 근무지에서 근접오류를 경험하신 적이 있습니까?

① 있다 ② 없다

2. 귀하께서는 수술과 관련하여 지난 1년간 근접오류를 경험한 적이 있습니까?

문 항	그렇다	아니다
① 잘못된 신체부위를 수술하기 전 발견한 경험이 있다.		
② 잘못된 환자를 수술하기 전 발견한 경험이 있다.		
③ 잘못된 수술 절차를 적용하기 전 수정한 경험이 있다.		
④ 수술과정에서 환자 몸에 이물질을 남길 뻔 한 경험이 있다.		
⑤ 수술 전 또는 수술 중 감염이 발생할 상황에 대해 발견하고 대처한 경험이 있다.		
⑥ 수술 전 또는 수술 중 화상이 발생할 상황에 대해 발견하고 대처한 경험이 있다.		
⑦ 기타(구체적으로 명시)		

3. 귀하께서는 조제와 관련하여 지난 1년간 근접오류를 경험한 적이 있습니까? (주변의 경험이 아닌 본인이 직접 경험한 것만을 의미합니다.)

문 항	그렇다	아니다
① 의사의 오더를 검토하는 과정에서 잘못된 처방을 발견하여 수정한 경험이 있다.		
② 의사의 오더를 검토하는 과정에서 오류가 발생했지만 환자가 상해 또는 위해를 입지는 않았다.		
③ 조제를 진행하는 과정에서 오류가 발생했지만 환자가 상해 또는 위해를 입지는 않았다.		
④ 조제한 약의 검수 과정에서 잘못 조제된 약을 발견한 경험이 있다.		
⑤ 약품의 전달 지연이 발생했지만 환자가 상해 또는 위해를 입지 않았다.		
⑥ 기타(구체적으로 명시)		

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4. 귀하께서는 투약과 관련하여 지난 1년간 근접오류를 경험한 적이 있습니까? (주변의 경험이 아닌 본인이 직접 경험한 것만을 의미합니다. 상해 또 위해를 예방한 경우도 포함합니다. 예: 처방과 다른 약을 투여하기 전 발견)

문 항	그렇다	아니다
① 처방과 다른 약을 투약하기 전에 발견 또는 투약했지만 환자가 상해 또는 위해를 입지 않았다.		
② 잘못된 경로로 투약하기 전에 발견 또는 투약했지만 환자가 상해 또는 위해를 입지 않았다.		
③ 잘못된 용량을 투약하기 전에 발견 또는 투약했지만 환자가 상해 또는 위해를 입지 않았다.		
④ 다른 환자에게 투약하기 전에 발견 또는 투약했지만 환자가 상해 또는 위해를 입지 않았다.		
⑤ 다른 시간에 투약하기 전에 발견 또는 투약했지만 환자가 상해 또는 위해를 입지 않았다.		
⑥ 기타(구체적으로 명시)		

5. 귀하께서는 환자보호와 관련하여 지난 1년간 근접오류를 경험한 적이 있습니까? (주변의 경험이 아닌 본인이 직접 경험한 것만을 의미합니다.)

문 항	그렇다	아니다
① 환자의 낙상을 예방하였거나 낙상이 발생하였지만 상해 또는 위해는 입지 않았다.		
② 환자가 화상을 입기 전 예방한 경험이 있다.		
③ 환자가 욕창이 발생하기 전 예방한 경험이 있다.		
④ 환자의 자살미수를 발견하고 대처한 경험이 있다.		
⑤ 기타(구체적으로 명시)		

6. 귀하께서는 환자의 검사와 관련하여 지난 1년간 근접오류를 경험한 적이 있습니까?
(주변의 경험이 아닌 본인이 직접 경험한 것만을 의미합니다. 상해 또는 위해를 예방한 경우도 포함합니다.
예: 환자에 대한 검사를 누락하기 전에 발견)

문 항	그렇다	아니다
① 환자의 검사과정에서 오류가 발생했지만 환자가 상해 또는 위해를 입지 않았다.		
② 환자의 검사가 지연되었지만 환자가 상해 또는 위해를 입지 않았다.		
③ 환자의 검사결과에 따른 후속조치를 누락했지만 환자가 상해 또는 위해를 입지 않았다.		
④ 환자에 대한 검사를 누락했지만 환자가 상해 또는 위해를 입지 않았다.		
⑤ 검사결과 과정에서 오류가 발생했지만 환자가 상해 또는 위해를 입지 않았다.		
⑥ 기타(구체적으로 명시)		

7. 귀하께서는 수혈과 관련하여 지난 1년간 근접오류를 경험한 적이 있습니까?

문항	그렇다	아니다
① 환자의 혈액형과 일치하지 않은 혈액을 환자에게 투여 전 발견한 경험이 있다.		
② 서로 다른 환자의 혈액을 환자에게 투여 전 발견한 경험이 있다.		
③ 기타(구체적으로 명시)		

II. 일반적인 특성

8. 연령 (만 세)

9. 성별

① 남성 ② 여성

10. 결혼여부

① 미혼 ② 기혼 ③ 기타

11. 최종학력

① 고졸 이하 ② 전문대졸 ③ 대졸 ④ 대학원 재학/졸업 이하

12. 고용형태

① 정규직 ② 비정규직

13. 근무부서

① 간호부(병동) ② 간호부(외래) ③ 건강검진센터 ④ 마취/회복실 ⑤ 물리치료실 ⑥ 분만실 ⑦ 신생아실
 ⑧ 약제팀 ⑨ 영상의학과 ⑩ 인공투석실 ⑪ 응급의료센터 ⑫ 중환자실 ⑬ 진단검사의학과 ⑭ 특수기능검사실
 ⑮ 수술실

14. 총 근무 경력 (숫자만 표기 예, 11개월 근무시: 0년 11개월로 표기)

(년 개월)

15. 현 부서에서의 근무경력 (숫자만 표기, 위와 동일한 방법으로 표기)

(년 개월)

16. 직위

① 팀원 ② 책임/주임 ③ 파트장/계장 ④ 과장/팀장