1. Introduction
Since Institute of Medicine (IOM) published “To Err is Human” in 1999, patient safety has become the most critical global medical issue. In Taiwan, there were several serious medical adverse events caused by SARS during 2001 to 2002. These situations raised public awareness of patient safety. In the following years, Patient safety committee and relevance meetings were set up one after another. Medication adverse event (MAE) is the first priority of all categories of adverse event. Everything has two sides; correct drug administration could effectively treat the diseases. On the other hand, drug will also threat patients’ life under inappropriate administering way. Planning suitable medical strategies based on annual reporting result could significantly decrease the rate of MAEs. Thus, the reporting integrity and effectiveness of reporter’s cognition which affect quality of MAEs report are quiet important.

2. Method
2.1 Objectives
Research contains three objectives, first is to investigate nurse’s cognitive description ways of happened MAEs reports; second is to investigate the integrity and effectiveness of nurse’s cognitive description ways of happened MAEs reports; third is to investigate nurse’s subjective importance ranking of reported items. Based on the research result, we hope that we could provide some suggestions to improve the reporting system and procedure.

2.2 Participants
Research will focus on nurse, the front line clinical staff. There were 36 nurses (exclude ICU nurse, trial nurse, head nurse and nurse manager) from a metropolitan hospital in north Taiwan. Participants were divided into three groups based on their seniority. Group 1 is participant who works in subject hospital for 0.3–3 years; group 2 is participant who works for 4–6 years and group 3 is participant who works for more than 7 years.

2.3 Materials
We constructed four MAE scenarios based on the real cases published by Taiwan patient reporting system annual report. We also made a list of MAEs reporting needed items based on WHO conceptual frame work and Taiwan patient safety reporting system (TPR). Both of the materials were reviewed by three experts from different medical profession.

2.4 Pilot test & formal experience
6 participants were randomly chosen for pilot test (2 participants in each group), and 30 participants joined in formal experiment. Same procedure would be practiced in both pilot test and formal experiment.
Participants have to read four scenarios and report in open-end descriptive way one by one. After finish the scenario reports, they will be asked to rank needed items base on subjective feeling of importance. Finally, we combine the result of report and ranking then give them an individual interview.

2.5 Data analysis
Research method includes both qualitative and quantitative method. Qualitative data will be categorized into different factors and dimensions while quantitative data will be analysed by IBM SPSS Statistic 22.
We analyse the integrity score and effectiveness score of their reports. In the integrity part, participants’ reports will be compared with original scenarios and experts’ report example; in the effectiveness parts, we will score participants’ reports based on the reporting needed items weighted by experts.
3. Results

There are three parts of results: Definition of adverse event (AE) and medication adverse event (MAE), report results and subjective ranking of report needed items.

3.1 Definition of AE and MAE

For the definition of adverse event (AE), participants mentioned three dimensions of definition: once the medical behaviours result in patients’ unusual reaction or potential risk will be defined as AE (63%), behaviours of medical staff aren’t standard (53%), search definition published by TPR system (13%).

For the definition of MAE, participants mentioned two main dimensions of definition: medical behaviours related to drug treatment (53%), detailed steps of drug treatment (43%), e.g. wrong prescription, wrong patient name.

The impact comparison between seniority and report experience, 60% of participants thought that report experience will affect report performance more than seniority while 20% of participants took seniority part. 17% of participants thought that both of two will affect equally. (Figure 1)

![Figure 1. The comparison of impact on report performance between seniority and report experience](image)

3.2 Report results

We divided participants’ report patterns into four types: A (report with full case description, wrong doing and correction and improvement), B (report with part case description, wrong doing and correction and improvement), C (report with wrong doing and correction and improvement), and D (report with full case description).

Percentage of report pattern in each group is showed in figure 2. In group 1, 44.4% of participants used type A, 22.2% used type B and C, only 11.1% used type D; in group 2, 55% of participants used type A, 18% used type B, 9% used type C and 18% used type D; in group 3, 40% of participants used type A, 10% used type B, 50% used type C and no participant used type D.

![Figure 2. Percentage of report pattern in each group](image)
Integrity and effectiveness report score are not significantly different among three groups. But there is significant statistical positive correlation between effectiveness average score and integrity average score (Pearson’s r: 0.996). The top 6 frequently missed items in their reports are “category”, “date of occurrence”, “time of occurrence”, “person who detects”, “medical dealing” and “level of patient harm”. The top 3 incomplete items in their reports are “process”, “people involved” and “affected people”. In the part of cause analysis of each case, all participants could focus on personal factors; 46.7% of participants could focus on multi-personal factors and only 28% could focus on systematic factors. (Figure 3)

![Percentage of cause analysis](image-url)

Figure 3. Percentage of cause analysis

### 3.3 Subjective ranking of report needed items

Top 10 important items are “phase of occurrence”, “process”, “cause”, “type of drug error”, “prescription”, “incorrect drug name”, level of patient harm”, “patient disease”, “involved factors” and “category”.

### 4. Discussion

#### 4.1 Definition of AE and MAE

The inference of AE definitions in research result is about nurse’s multi-roles. Nurse is the connection between hospital and patients; they not only provide care to patient but also advocate the strategies in hospital. Based on multi-roles nurse plays in medical field, they will define AE both from the position of hospital and patient.

In the part of MAE definition, nurse tends to define MAE depend on their routine, e.g. drug administration and 5W information. That is the reason why more than 40% of participants defined MAE as wrong doing about drug treatment.

For the impact comparison between seniority and report experience, participants who stand for report experience, think that someone who have richer report experience will be more familiar with report system. They will report fluently, because they have more chances of being instructed by seniors. On the other hand, participants who stand for seniority, think that senior nurses are well-experienced in clinical duties, they seldom make mistakes. Also, they have to check juniors' reports many times in their career lives, so, they will be skilful in correction and suggestion.

#### 4.2 Report results

Compare with the other 2 groups, group 1 who just began their clinical lives have less report experience. Under this situation, they may behave in two ways: write all the detail they saw in the case (type A & B) or report uncertainly (type C). Group 2 became more experienced. Because the time interval between last time report and experiment isn’t long, their fresh memory makes them remember more items in report system and have more complete concept than the other 2 groups. Group 3 is well clinical experienced. Participants in this group didn’t use report system for a long time. Two main opposite patterns will shows in report results. They will be more familiar with report with the increase of seniority; or they become very unfamiliar with report because of memory loss. The design of system emphasized “wrong doing & correction” and “improvement” also makes half of senior participants show more type C pattern.

Although there is not a significant statistical difference among 3 groups report score, it still shows a
trend in this bar chart. Group 2 performed better than the others. Participants in group 2 showed more type A and fewer type C. Score is related with report pattern, type A is the best pattern related to highest score. Two factors will affect the score difference: complexity of case and time. The difference increases when case becomes complex, because more complex cases contain much more information. Participants tend to use the way they are used to report with the increase of experiment time, so the difference shows in case3 and case4.

Main factors affect missed items and incomplete items are “report habit”, “experience” and “psycho condition”. The report system in hospital is designed into checkbox format. Although it’s convenience for guiding reporter, it will weaken their ability to remember report items and report sequence. Most of participants mentioned they forget what items should be contained in report because they depend a lot on checkbox. “Experience” also affects report results. Participant who is unfamiliar with system doesn’t have concept of report then she will miss items when doing the experiment. “Psycho condition” is about the fatigue and pressure of participants. Due to limitation of time, we could only do the experiment after participants’ routine. Most of participants were tired and could not pay attention for a long period. They may did experiment carelessly because of patience loss.

Two explanations of cause analysis result. First is about nurse duty, once the events involve other units or doctors, nurses will think that aren’t their business, they are unfamiliar with others procedure, so they won’t judge them, especially doctor. Nurses think that doctor have their own thought, own medical way, so interference in their decision making isn’t wise. Second is about their concept of medication adverse event. During the interview, they mentioned 5W many times. They think that as long as they practice this rule actually, MAEs could be prevented. This kind of concept limits their thought. According to Cheese model of James Reason in 1990, the AEs happened when there are holes in each defense layer, which means that isn’t only nurse responsibilities. They are just one of defense layer of system. Unfortunately, fewer of frontline clinical staffs, nurses, notice that.

4.3 Subjective ranking of report needed items

Participants need case information (“phase of occurrence”, “process”, “cause” and “type of drug error”) to understand whole story of event. Steps can be taken to make provision against MAEs base on case information. Different drug error should be treated with different way. Drug information (“type of drug error”, “prescription” and “incorrect drug name”) helps medical staffs understand the patient’s situation.

5. Conclusion

Result of report quality will not generally increase with seniority and report experience. It’s more about report time interval. Senior nurse will get used to the critical MAEs with increase of work experience. It’s not a good sign for internal medical field. System-oriented concept is not general in nurse group which may directly affects the strategies made by hospital based on reporting system. The improvement of reporting system should focuses on the items ignored easily.

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References


