

Human Factors Approach to Inspect the Procedure of Intravenous Chemotherapy

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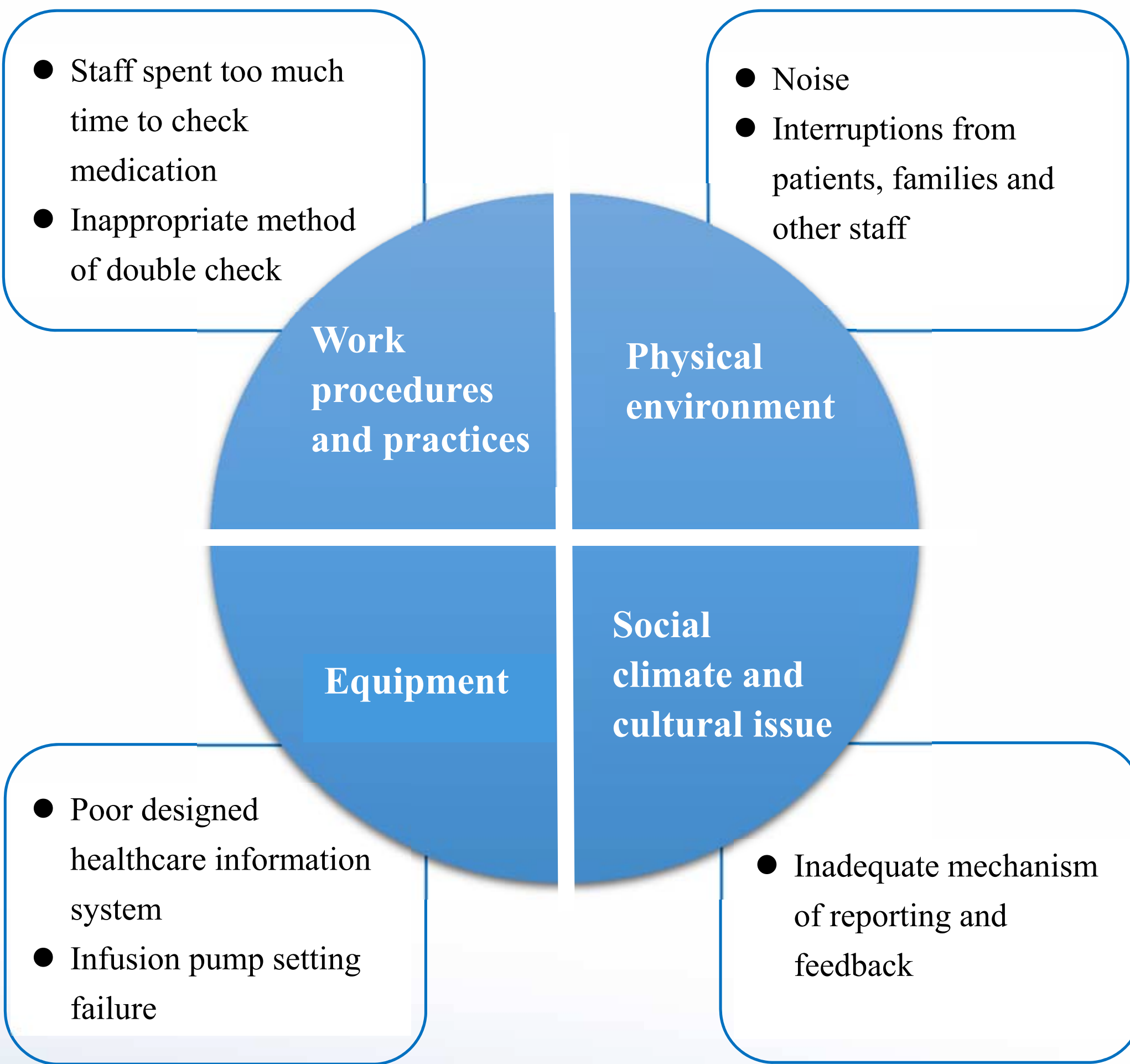
Objectives

Intravenous chemotherapy is a complex procedure that is highly depending on medical professionals. Errors caused by human failures could occur across the entire phase of prescribing, dispensing and administering. Therefore, this study aimed to inspect the procedure of intravenous chemotherapy via human factors and risk management principles in order to find out systematical related issues.

Procedure of direct observations



Four categories of human factors



Results

Two medical centers and two regional hospitals with different characteristics were involved in the project. The results found:

- Phase of prescribing:
 - Advantages: All participating hospitals have been adopting electronic ordering systems linked related information of patients to avoid applying unnecessary or inappropriate medication for intravenous chemotherapy.
 - Disadvantages: Too much information revealed on the medical system may result in ignoring the critical one. For example, too many colors for distinction and warning messages may cause “alarm fatigue”.
- Phase of dispensing:
 - Advantages: Using barcode system in the process of examining prescription, preparing, dispensing and delivering drugs had be noticed to improve efficiency and accuracy of the therapy.
 - Disadvantages: Pharmacists were frequently interrupted by people, phone calls or other inquiries which can lower their attention at the work.
- Phase of administering:
 - Advantages: The signal of wearing gowns at nursing station would remind co-workers the start of intravenous chemotherapy. In this case, once patients call for help and may interrupt the procedure, other nurses can assist in time.
 - Disadvantages: IV pump set failures can be an issue as nurses have to familiar with different kinds of pumps and calculate flow rate in this stage.

Methods

The project to identify human factor issues related to intravenous chemotherapy was conducted through 3 steps.

- Reference reviews: Participating hospitals had to provide related references about hospital standards and sentinel events before experts’ visiting to investigate potential risks.
- Direct observations: Four to five experts in the background of patient safety or human factor engineering professionals were arranged to observe the whole procedure of prescribing, dispensing, delivering and administering.
- Interviews: A semi-structured interviews were conducted separately with attending physicians, pharmacists and nurses.

Conclusion

Medication errors in intravenous chemotherapy may lead to serious consequences. This project was a preliminary study conducted in order to evaluate the potential risks of healthcare procedures and establish a framework for prospective study. We hope patient safety can improve via reducing human failures through this project. The findings are as follows:

- The design of ordering systems should follow human factor principles to reduce prescription errors.
- Interruptions should be minimized during critical practices. Medical professionals could create a no-interruption zone to distant from nonessential activities.
- We suggested the government could establish standards about the operating interface and screen display of different types of infusion pumps.

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