ON BUILDING AN INFORMATION-BASED INFORMATION SEAT ARRANGEMENT SYSTEM FOR PEDIATRICS INFUSION CENTER THROUGH 6-SIGMA THEORY

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ABSTRACT

Purpose*: this paper intends to divide areas and make seat arrangements for child patient in the pediatrics infusion center, so as to satisfy patients' treatment demand with limit space as well as improve the infusion hall environment.*

Method*: Our hospital's pediatrics infusion center has applied 6-sigma method into the information network to divide areas and make seat arrangements for child patient subject to vein treatment.*

Result*: patients' treatment demands have been satisfied with limited space; meanwhile, clean and orderly environment has been obtained in the infusion center and nursing service procedures have been optimized.*

Conclusion*: the information-based seat arrangement through 6-sigma method by the pediatrics infusion center is able to ease burden on nurse, improve diagnose and treatment environment, effectively guarantee patients' nursing safety, reduce occurrence rate of nursing dispute, and improve satisfactory from emergency patients, his/her relatives, and nurse.*

Keywords*: 6-sigma, pediatrics infusion center, nursing safety, information-based.*

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Introduction

Along with the implementation of two-child policy, the number of child patients is increasing. Besides dedicated children's hospital, numerous patients are flocking to Class III Grade A hospital with pediatrics outpatient department, emergency treatment, ward, and infusion center.

Further, the improved life quality has made people have greater demand on treatment feeling and experience, i.e., except the basic diagnose and treatment, there are greater demands and wishes on human experience. Then how the pediatrics infusion center, which is the forefront for receiving and providing outpatient emergency treatment and a dedicated department that has to cure child patients in the presence of numerous relatives[(1)], can utilize limit space to receive and cure large quantities of patients, meanwhile, improve the environment of densely-populated infusion hall, guarantee every child patient with a relatively fixed position for treatment, and orderly complete nursing service? All of these are keys for improving patients' treatment feeling and securing patients' safety. Thus, our hospital's pediatrics infusion center has applied 6-sigma method into the information-based network[(2)] to divide areas and make seat arrangements for child patient subject to vein treatment[(3)], so as to meet the patients' treatment demand, meanwhile, maintain an orderly and clean infusion center, optimize nursing service procedures as well as relieve the burden on nurses.

Object and method

Object

We randomly selected top 300 child-patient relatives that are without information-based man-

agement mode from October 2015 to March 2016, top 300 child-patient relatives that are under information-based management mode from October 2016 to March 2017, and nurses served in both periods for the infusion center as the research objects. Inclusion criteria: child patients only subject to short-term treatment in the outpatient department or emergency treatment department, child patients with treatment duration less than 5 days, and nurses served for the infusion center from October 2015 to March 2017. Exclusion criteria: patients waiting for ward bed for treatment; patients with treatment duration more than 5 days; nurses for short-term post turning, in-service training, and compliance training.

Research method

Survey method

Questionnaire survey method was adopted after approval has been obtained from our hospital. Subject research fellow dispatched and collected materials on-site, guided child patients, relatives, and nurses to fill the material under the unified instructions by themselves, and recovered the questionnaire on-site after check. For this survey, total of 600 questionnaires had been dispatched, in which, 570 effective questionnaires have an effective rate of 95%.

Research tool

• General material questionnaire designed by researchers, contents of which include survey on relatives' degree of satisfaction, nurses' degree of satisfaction, occurrence rate of adverse event, occurrence rate of dispute between nurse and patient as well as other statistical measuring scale.

• By employing 6-sigma quality management method[4], it was found that the information-based system should be the most potential improvement procedure, i.e., to separately arrange seat for appointment patient and line-up patients with the purpose to optimize nurses' service procedures. This technique was implemented as per general implementation mode DAMIC of the 6-sigma.

Concrete research method

The research was divided into five stages: Define, Measurement, Analysis, Improve, and Control. DMAIC is a process ring. DMAIC represents fives stages of 6-sigma management: Define, Measurement, Analysis, Improve, and Control.

• Define stage: this stage was to identify issues of infusion department, issue urgently needed to be resolved, and key demand according to 6-sigma items. After survey, research, and interview at earlier stage, it was summarized that unfixed seat for child patient receiving infusion in the outpatient department was the most urgent issue to be solved;

• Measurement stage: this stage was to design questionnaire, implement survey and interview as well as widely collect current service quality data of the department in the empirical process, so as to ensure empirical truthfulness and efficiency;

• Analysis stage: this stage was to analyze data collected in the measurement stage, so as to determine a set of variables in sequences of importance. Data statistics were made for the questionnaire, interview result, and other results with the purpose to find out the variable that affects unfixed patient seat;

(• Improve stage: after earlier stages of define, measurement, and analysis, it was determined that "information-based system" should be employed to separately arrange seats for appointment patients and line-up patients, so as to meet patients' seat demand in course of treatment;

• Control stage: this stage was mainly for controlling and consolidating improvement achievement. After review of the whole project process, following measures were stipulated to control the implementation results:

◆ To stipulate a normalized and standardized process and flow chart;

◆ To train nurses;

◆ To design a degree of satisfaction evaluation sheet for the patients and nurses towards the implementation of the said process;

◆ To set up a dedicated team of the department for regular check on the project implementation.

Statistics method

SPSS15.0 Statistics Software was employed for statistics and analysis in this research; statistics material was tested by X-row chi-square; mode average number ± standard deviation was used to represent measurement material; t test. There was relatively large differences on the clinical treatment results for the two patient groups when $P<0.05$, which has the statistics significance.

Results

According to the statistics result on patients' and relatives' degree of satisfaction questionnaire and interview data prior to and after the application of 6-sigma quality management and informatization[5] to seat arrangement in the infusion center, the degree of satisfaction after application thereof had increased by 9% and the occurrence rate of dispute between nurse and patient decreased by 2 (As shown in table 1).

Group	Cases	Satisfaction	Basic satisfaction	Not-satisfaction	Total degree of satisfaction
Prior to improvement	286	240	2	44	84.60%
After improvement	284	265	5	14	95.10%

Table 1: Patients' degree of satisfaction survey prior to and after information-based seat arrangement.

According to the statistics result on nurses' degree of satisfaction questionnaire and interview data prior to and after the application of 6-sigma quality management and informatization to seat arrangement in the infusion center, the degree of satisfaction after application there of had increased by 9% and the occurrence rate of dispute between nurse and patient decreased by 2 (As shown in table 2).

Group	Nurse's degree of satisfaction	Occurrence of adverse event	Occurrence rate of dispute between nurse and patient
Prior to improvement	86%	0	6
After improvement	95%	0	4

Table 2: Nurse's degree of satisfaction survey, adverse event occurrence rate, and dispute between nurse and patient occurrence rate prior to and after application of information-based seat arrangement.

Discussion

6-sigma method shall be used to identify crucial quality point and defect in the infusion process for patient in the pediatrics department. Process to be improved shall be classified, so as to find the most potential process to apply information-based system.

• Seats shall be separately arranged for appointment patients and line-up patients; seat number verification segment shall be added to manually arrange seats for patients with similar names and close seat number, so as to eliminate impact and interference from human-related factors, reduce error rate, and secure patients' medication safety. Further, each child patient shall be secured with a fixed seat for infusion treatment.

• In course of large quantities of infusion demand and busy seasons, after effective separation of patients, "one chair for one person" shall be guaranteed, so as to avoid dispute among seat by patient relatives.

• Noisy environment in the infusion room shall be avoided, order in the infusion premise shall be remained, and burden on nurse shall be eased; further, one child patient occupying several seats shall be prevented, so as to secure that every child patient has a fixed seat for infusion treatment, improve child patient's medication safety, and enhance overall child patient's comfort and relatives' degree of satisfaction.

• Informatization shall be utilized to separate patients into two areas; then, nurses in two groups shall separately execute infusion, bottle connection, needle pull-out and other services for appointment child patients and line-up patients, so as to reduce ineffective and repeat nursing service[6].

Conclusion

The information-based system can effectively separate information of appointment child patients and line-up patients and nurses can separately execute nursing service for the appointment group and line-up group from the start to the end of infusion. Partition number management for the infusion area can not only secure a fixed seat for patients, but also can avoid cross infection. Nurses' nursing child patient by area can effectively avoid repeated operation, improve nurses' service efficiency per unit time, enhance nurses' sense of responsibility, and service attitude. Further, it will allow scientific performance management on the nurses' service quantity.

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