

DOI: 10.21767/2574-2825.100008

The Function of Nursing Management for Stomatology Clinic Infection

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Received Date: February 03, 2017; Accepted Date: March 04, 2017; Published Date: March 09, 2017

Citation: Gao Q, Sui W. The Function of Nursing Management for Stomatology Clinic Infection. J Nurs Health Stud. 2017, 2:1.

Abstract

Objective: To provide the necessary evidence for standardizing stomatology clinical nursing, the functions of nursing management for the prevention and control of clinical infections were analyzed comprehensively in the stomatology hospital.

Methods: The clinical data of outpatients were collected in a stomatology hospital from January 2014 to December 2015, in which, there were 4,104 patients in 2014 of whom did not receive nursing management while in 2015, 4,172 patients had nursing management performed. The qualifications of environmental hygiene and incidents of infection in the clinic during these 2 years were compared and analyzed.

Results: The qualified rate of environmental hygiene and infection rates were reduced significantly in the stomatology clinic in 2015 after the implementation of nursing management, showing obvious differences compared to the analysis of 2014, suggesting statistical significance ($P < 0.05$).

Conclusions: The work of the nursing management is strengthened and implemented successfully in the clinic of the stomatology hospital and has effectively improved the quality of the clinical environment in addition to helping prevent and reduce the incidence of clinical infections to ensure the favorable recovery for patients and thus showing an important practical significance in clinical practice.

Keywords: Nursing management; Stomatology clinic; Hospital infection

Introduction

The clinic, one of the most important departments in a hospital, is an important window of service and has a high flow of people, strong mobility, and other characteristics. Cross infection and contamination is a major point of emphasis for the prevention and control of hospital infections in the stomatology clinic, which can not only affect clinical success,

but also increase unnecessary expenses and burdens on the patients [1] as well. It was reported that 35%~50% of hospital infections resulted from improper procedures in clinical nursing and the lack of strict nursing management [2]. In order to minimize or eliminate the stomatology clinic infection it is necessary to strengthen and attach importance to nursing management in order to provide patients with safe, comprehensive, and favorable nursing services. Hospital infection was analyzed in this article for the time both before and after the implementation of nursing management for the stomatology clinic in our hospital, as described below.

Materials and Methods

Clinical data

The clinical data of outpatients were collected in our stomatology center from January 2014 to December 2015 and divided retrospectively into 2 years of monitoring data regarding the environmental hygiene of the clinic. Among them, there were 4,104 patients from January to December 2014, of which 2,317 were male patients and 1,787 were female patients between an age range of 8 and 71 years old, with a medium age of (41.2 ± 5.1) years old; there were 4,172 patients from January to December 2015, of which 2,522 were male patients and 1,650 were female patients with an age range between 7 and 74 years old, with a medium age of (39.8 ± 6.2) years old. No significant differences were observed in essential information or the conditions and treatments of the patients in these 2 years; hence, a comparative study could effectively be carried out.

Methods

The special management of the nursing staff was implemented at the end of 2014 and the work of the nursing management staff had been put into effect based on the realities of the stomatology clinic of the hospital since January 2015 including the following guidelines and responsibilities:

(1) A group of clinical nursing management was implemented and improved. Under the guidance of the management and control committee for hospital infection, the hospital nursing department organized the hospital nursing staff and established a prophylaxis and management group for clinical infections, as well as appointed the head-nurse of the

department the person in charge. The group constructed a plan for the mid and long term management of the clinic and determined specific requirements in accordance to the realities and relevant areas of focus for the hospital clinic in combinations with the infection characteristics of the stomatology clinic. A reasonable and feasible plan for the prevention and control of clinical infections is a key focus for the nursing management team to put into effect. In addition, the management group was required to inspect and randomly check the clinical department regularly in order to understand timely the situation of the clinic, discover contamination or infection, and effectively deal with problems in a swift manner or appropriately regulate measures for the actual requirements to ensure the prevention and control measures for stomatology clinic infection to be implemented to success.

(2) The training of the nursing staff was strengthened. The prevention and control department of clinical infection cooperated closely with the nurses of the department, and enhanced and attached importance to theories and skills training regarding disinfection, sterilization, and isolation etc. Specifically, key members of the nursing staff were chosen to be involved in the training of the prevention and control of infections in a superior hospital, as well as the prevention and control work to be carried out within the entirety of the hospital. The new nurses were instructed to perform training in correlation theories of the prevention and control of hospital infection. In order to educate them on quality awareness and the prevention and control awareness of clinical infection, the nursing staff of the department were organized regularly to learn the Technical Standards for Disinfection in the Hospital and the Technical Standard for the Disinfection of Stomatological Instruments, as well as the "two rules and one standard" of the central sterile supply department. In addition to other rules and regulations [3] in order to help them fully realize the importance of the prevention and control for clinical infections in the stomatology hospital, as well as perform each nursing procedure in strict accordance with sterile principles during the actual nursing procedure as a means to avoid cross infection.

(3) The management of the environmental hygiene in the clinical department was enhanced. It should ensure the favorable air circulation and ventilation in the clinical department especially regarding the use of the air conditioner as the ventilation operation must be performed effectively to ensure fresh air and minimize the number of microorganisms indoors. Additionally, after the completion of the diagnosis and treatment of each person, a chlorine-based disinfectant was needed to thoroughly wash spittoons; work surfaces were cleaned with Cavi wipes and changed with new plastic covers in a timely manner. The ground was washed through at the end of the diagnosis and treatment each day; the chlorine-based disinfectant was used to wash the surface areas if there were bloodstains, the concretion of the secretion, or other contaminants on the ground. The disinfection was carried out using ultra-violet lamps to minimize residual bacteria.

(4) Hands were washed properly and effectively. The need for the staff to wash their hands is the most essential and effective way to prevent and reduce cross infection in hospitals. Thus, the medical staff ought to perform quality hygienic behaviors both before and after nursing which includes washing hands properly and effectively or wiping their hands thoroughly with disinfectant. Hand-washing can effectively remove microorganisms from the hands in order to disbranch the pathway of bacterial infection. In addition, each consultation room was equipped with sinks, as well as images and words regarding hand-washing opportunities were set as the screen savers of the doctors' computers in each consultation room; an effective and convenient method to remind the medical staff to wash their hands constantly throughout the day. Heat induced water taps were selected for the sinks to avoid hand to sink contact. Furthermore, a special liquid soap for medicine was applied, and disposable and clean tissues were made available to wipe the hands dry. Proper hand-washing techniques were carried out in strict accordance with the Standard for Hand Hygiene for Healthcare Workers.

(5) Protective measures were performed and established. In order to enhance and continuously provide protective awareness for the medical staff of the department, corresponding protective measures were performed in strict accordance with standardized and protective requirements at any time of contact with the patients' blood and secretion. The standard requirements included keeping work clothes in accordance to health standards, as well as ensuring the proper management of safety appliances. In patient's treatment expelling droplets, it is important to utilize strong suction and proper diagnosis; regarding diagnosis and treatment, face masks are to be worn, especially when opening dental pulp and cleaning teeth; the patients' eyes also had to be protected. The proper use of the rubber dam during dental treatment can diminish contaminative aerial fog formed by saliva and blood, as well as can effectively avoid oral mucosal trauma caused by the treatment. The key to standard prevention is bi-directional protection, i.e. the spread of pathogens can be controlled between the medical staff and the patients [4].

(6) Stomatological instruments were disinfected in a timely manner. Used stomatological instruments are required to be disinfected in strict accordance with the relevant regulations. The most appropriate disinfection method according to the materials and functions etc. of stomatological instruments must be used. Stomatological instruments are difficult to clean thoroughly due to the vast variety and diversity of forms, such as relatively short drill points which is serrated multi-layered in their front, thus difficult to clean thoroughly. There is a very fair possibility that stomatological instruments are contaminated by blood, saliva, and inflammatory tissues etc. because of their frequent use in the clinic, hence, they ought to be disinfected appropriately and sterilized thoroughly in accordance with the requirements. In practical terms, instruments set in the oral cavity should be disinfected after each use with a patient; instruments that have direct contact with a patient's wounds and injured mucous membranes should meet sterilization requirements before use, including

dental hand pieces and dental burs etc.; instruments that have full contact with a patient's skin and mucous membranes are to be in accordance with the prescribed disinfection requirements before official use, such as mouth mirrors and tooth glasses etc.; instruments for repairing, orthodontic treatment, and other molds that have contact with a patient's body fluid and blood must be disinfected completely before being brought to a dental laboratory.

(7) The disposal and management of medical waste was emphasized and strengthened. There is a great deal of medical waste in the clinic of the stomatology hospital; hence, it is necessary to enhance this management to efficaciously prevent hospital infection, which is one important task for the current nursing management. The classification, collection, transportation, storage, and disposal etc. of medical waste must be supervised in strict accordance with regulations. Furthermore, it must enhance hospital cleaners in business training, train them in the relevant knowledge of medical waste disposal, and make sure they classify, place, and clean medical waste in strict adherence with the requirements and in a timely manner, as well as perform individual protection measures effectively during their time of work.

(8) Nursing supervision was performed effectively. The department should cooperate with the department of the prevention and control for hospital infection to inspect all jobs in the nursing department of the clinic to monitor the disinfection effects and environmental hygiene of the department of the prevention and control for hospital infection. Nursing problems of the department should receive timely feedback and be solved or corrected in a timely manner.

Observation indexes

As defined via Hygienic Standard for Disinfection of the Hospital, the quality of the environmental hygiene of the department throughout this 2 year period was evaluated including hands, the indoor air, and the surface of objects. The results were then calculated for the qualified rate; simultaneously, the hospital infection during the 2 year period was controlled.

Statistical analysis

The data of this study were analyzed and processed with SPSS18.0. The enumeration data were expressed with percent, and the chi-square test was used; $P < 0.05$ suggested that the differences had statistical significance.

Results

Comparison of the qualified rate of the environmental hygiene of the department over this period of two years

Compared with that of 2014, the qualified rate of the environmental hygiene in the clinic department increased significantly in 2015 and the differences indicated statistical significance ($P < 0.05$), as shown in **Table 1**.

Table 1 Comparison of the qualified rate (%) of the environmental hygiene of the stomatology clinic in 2014 and 2015.

| Year | Operation | Air | The surface of objects | The average of qualified rate |
|----------|-----------|-------|------------------------|-------------------------------|
| 2014 | 82.14 | 82.35 | 71.62 | 78.22 |
| 2015 | 99.08 | 98.25 | 98.51 | 98.51 |
| χ^2 | 2.115 | 3.052 | 3.526 | 5.183 |
| P value | <0.05 | <0.05 | <0.05 | <0.05 |

Comparison of clinic infection rate in these 2 years

After the implementation of nursing management, the infection rate of the stomatology clinic was 0.89% in 2015 and

showed obvious differences in comparison to the period of time before the implementation in 2014 (2.58%), suggesting statistical significance ($P < 0.05$), as shown in **Table 2**.

Table 2 Comparison of the infection rate of the stomatology clinic in 2014 and 2015 (n, %).

| Year | Total cases | The number of infection | Proportion |
|------|-------------|-------------------------|------------|
| 2014 | 4,104 | 106 | 2.58 |
| 2015 | 4,172 | 37 | 0.89* |

Notes: compared with those in 2014, * $P < 0.05$ ($\chi^2 = 2.065$)

Conclusions

The stomatology hospital has the characteristics of both big clinics and small wards, and outpatients mostly involve children and the elderly. The clinical diagnosis and treatment of oral diseases are required to be carried out in the oral cavity. Saliva, secretion, and the blood of the patients, as well as a variety of pathogenic microorganisms, are main risk factors of clinical infection in the stomatology hospital, such as the hepatitis B virus and HIV virus etc., which can directly contaminate various kinds of stomatological instruments and the hands of medical staff, resulting in an increasing possibility of clinical infection [4-6].

A variety of medical instruments and objects are required to apply an accurate clinical diagnosis and provide treatment of oral diseases; specifically, dental drills and dental descales etc. may cause large amounts of air foam and aerial fog during their high-speed operation, which may spawn pathogenic microorganisms, resulting in the direct contamination to the air and the surface of objects in the clinical department. Synchronously, they may also enter into the human body through contact with the medical staff's hands when touching the mucous membranes of oral and nasal cavities, as well as the injured skins of patients, resulting in cross infection between the doctors and nurses and the doctors and patients [7]. Furthermore, various types of instruments for the diagnosis and treatment of patients are also among the causes of cross infection, specifically including: (1) Medical equipment used for mediation that could cause cross infection, such as dental hand pieces and 3-function spray guns etc.; (2) Oral materials and drugs may lead to cross infection during their use, for instance, during cavity disinfection, pulp capping, pulp mummification, root canal disinfection, and other drugs that are often applied in the treatment of pulpitis and dental caries etc.; (3) Cross infection caused by dental impressions and models: for patients in the department of prosthetic dentistry, dental impressions will have direct contact with the patients' saliva and blood, thus causing a surface layer that carries microorganisms; thus, cross infection easily occurs between the doctors and patients of the dental laboratory while impressions are completed without effective disinfection and are otherwise regarded as perfused.

Based on this, effective prevention for clinical infection of the stomatology hospital requires the enhancement of the prophylaxis awareness of medical staff and prevention and

control education for hospital infection, as well as further positive development in nursing management. According to the situation of the clinic, our stomatology hospital actively carried out nursing management in 2015, i.e., established the prevention and control group for hospital infection, instructed staff on how to perform the work, strengthen the training in the medical staff, and effectively practicing good hygiene for the hands both before and after nursing. Furthermore, the importance of implementing the strict prevention and protection between the doctors and patients, as well as enhancing the disinfection management of medical instruments and disposal management of medical waste were taught. The qualified rate was up to 98.71% in the environmental hygiene of the department of this year, while the clinical infection rate was at 0.89%, lower than that of 2014. The implementation of the systematic and comprehensive nursing management in the clinic of the stomatology hospital can not only improve the environmental quality of the department, but also effectively prevent hospital infection, which is on display here and suggests significant importance to the hospital clinic.

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