

Risk Factors Analysis and Protective Measures of Sharp Instrument Injury among Nurses in the Operating Room

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Abstract: Objective: To study related problems and potential countermeasures of sharp instrument injury management among nurses in the operating room. Methods: A total of 46 incidents of sharp instrument injuries from January 2016 to February 2017 were selected as the object of study, and a questionnaire survey was used for investigation Results: Among various sharp instrument injuries of nurses in the operating room, 38 were caused by blade injuries and needle injuries, and 8 by glass scratches and other causes. Among the sharp instrument injuries of nurses in operating rooms with different working life, 29 cases occurred in those with working life below 5 years, 12 cases in 5-10 years, 4 cases in 10-20 years and 1 case in >20 years. Conclusion: Active, feasible and effective measures should be taken to deal with sharp instrument injuries, to strengthen the training of junior nurses in relevant contents, to emphasize standardized operation management, and to reduce occupational exposure and sharp instrument injuries of nurses in the operating room, so as to ensure the safety of medical and nursing personnel.

1. Introduction

Works in the operating room are rapid in rhythm as well as complex and numerous in work content[1]. Simultaneously, nurses in the operating room have more chances to engage in invasive procedure, resulting in higher risk of needle injuries than other medical staff. Sharp instrument injury in the operating room refers to medical accidents in which the risk of infection occurs due to cutting and stabbing by needles, glass products, surgical instruments, medical waste and other sharp objects during operation[2-3]. The occurrence of infection after sharp instrument injury is intimately associated with the type of sharp instruments such as blades, needles and scissors, the adoption of protective measures by nursing staff, and the number of viruses in the blood of patients. Sharp instrument injuries may cause severe damage to the health of medical staff. In order to reduce the incidence of sharp instrument injuries, the present study was carried out to explore and analyze current situation of needle injuries in the work of nurses in the operating room, and to provide corresponding preventive measures.

2. Materials and Methods

2.1 General data

From January 2016 to February 2017, 29,896 cases of sharp instrument injuries were selected from our hospital as the object of study. Statistics showed 46 cases of sharp instrument injuries, which were analyzed primarily in the present study.

2.2 Research method

A self-made questionnaire was used to investigate 46 incidents of sharp instrument injury. The contents of the questionnaire included personal data of nurses who suffered from needle injury, time

and causes of injury, types of operation, treatment measures after injury, psychological status of nurses and related protective measures. All the 46 questionnaires were completed and returned finally.

2.3 Statistical analysis

SPSS 18.0 statistical software was used for data statistics in this study, $P < 0.05$ indicated that the difference was statistically significant.

3. Results

3.1 Causes of sharp instrument injuries among nurses in the operating room

The results (Table 1) showed that 38 cases (82.61%) suffered from blade injuries and needle injuries, and 8 cases (17.39%) suffered from glass scratches and other causes.

Table 1 Causes of sharp instrument injuries among nurses in the operating room

Causes	Numbers	Percentage (%)
Needle injury	28	60.87
Surgical blade injury	10	21.74
Glass scratch	5	10.87
Others	3	6.52
Total	46	100.00

3.2 Incidence of sharp instrument injuries among nurses in the operating room with different working life

The results showed that 41 cases (89.13%) of sharp instrument injuries occurred in those with working life within 10 years, and 5 cases (10.87%) over 10 years.

Table 2 Incidence of sharp instrument injuries among nurses in the operating room with different working life

Working life	Numbers	Percentage (%)
<5 years	29	63.04
5-10 years	12	26.09
10-20 years	4	8.70
>20 years	1	2.17
Total	46	100.00

4. Discussion

4.1 Retrospective analysis of causes related to sharp instrument stabbing among nurses in the operating room

This study analyzed the related causes of injuries, which were described as follows: (1) It has been reported that sharp instrument injuries occurs mainly during operation among nurses in the operating room. Nurses should keep pace with doctors and cooperate tacitly during operation. However, injuries may occur easily when nurses do not pay attention to the details of the operation, such as the mixing of used blades, scissors, sewing needles and other items, and doctors randomly place used suture needles, blades, etc[4]. Besides, there may be higher risk in the case of careless sharp instrument passing and tidying, inaccurate action of needle piercing, failure to place items in the kidney dish in accordance with the regulations, and direct contact of the used blades and needles. (2) Nurses in the operating room have heavy tasks and less time for daily nursing training. In addition, the hospital emphasize more on the improvement of professional skills in the training of nurses, with insufficient training of nurses' awareness of prevention, which leads to injury. (3) Nurses have a weak sense of self-protection, and lack the awareness of self-protection, for example, they usually do not

wear gloves when contacting with patients' body fluids and blood. In the nursing of some patients with infectious diseases, nurses do not wear double gloves, waterproof coats and protective eye masks according to the regulations. (4) The working environment also has some influence. Nurses in the operating room have heavy workload, have to work at night besides normal shifts, and are highly nervous, stressed and lack of rest. In some rescue operations and major operations, nurses need to pay more attention, however, intense and disordered operation can lead to sharp instrument injury. (5) According to the results in the present study, junior nurses in the operating room were more likely to suffer sharp instrument injuries. Concerning its reasons, on the one hand, the working ability and psychological resilience of junior nurses are not fully competent for operating room nursing. On the other hand, daily training is actually inadequate, especially for the training of occupational protection of junior nurses.

4.2 Protection measures of sharp instrument injury

(1) Strengthen training: Hospital managers should emphasize the presence of sharp instrument injuries in operating rooms, improve rules and regulations, and formulate strict operating requirements for operating room nursing [5]. Nurses in the operating room should be proficient in understanding the risks and sources of occupational infections, as well as the importance of preventing sharp injuries and self-protection [6]. There is a need to conduct comprehensive training of nurses in the operating room, especially for junior nurses. It is necessary to strengthen the cultivation of prevention consciousness of sharp instrument injury and enhance the self-protection consciousness in such population. In addition, training of nursing operation skills and pre-job training should be carried out to make nurses skilled in operating room nursing quickly and operate strictly in accordance with the regulations, so as to reduce the incidence of adverse events. In the case of blood-borne infectious diseases, nurses should strengthen prevention significantly and deal with contaminated tools correctly to avoid infection. Meanwhile, hospitals should attach importance to the training of young nurses. Nurses should make preparation for protection to prevent direct contact between skin and mucosa with the source of infection in accordance with the operating rules strictly. (2) Standardize all kinds of operations: The main reason for sharp instrument injuries among nurses in the operating room is the lack of standardization of operation. Hospitals should formulate operating standards for nursing to prevent sharp instrument injuries in the operating room. It should include strictly standardizing the placement of instruments on the operating table, strictly forbidding the random movement of hand-held sharp instruments, and sealing the 80%-full sharp instrument box. Nurses should wear protective gloves instead of transferring instruments by hand at will. In addition, sharp instruments such as scalpels, sewing needles, scissors should be placed in suitable containers, which should then be stored a suitable position after using for further use. Additionally, nurses should wear gloves to operate when intravenous injection is given to patients with blood-borne infection. Besides, contaminated instruments should be disposed of as soon as possible. Operating room garbage should be sorted and cleaned up on time, which is conducive to reducing the incidence of air infection. (3) Establish safe operation rules and regulations, and use medical instruments rationally. The contaminated instruments should be strictly disinfected during operation. Nurses should master the usage of latex gloves and isolation gown in detail and strictly follow the requirements. International efforts have been made to reduce sharp instrument injuries in operating rooms, such as improving tool design, producing safety devices, reducing the risk of occupational exposure in the work of staff. (4) Emphasize nurse examination: In order to strengthen nurses' attention to sharp instrument injuries, relevant contents of sharp instrument injuries should be added to the annual theoretical assessment. In addition, more related books should be read to deepen the impression and enhance the preventive effect of sharp instrument injuries among nurses in the operating room.

4.3 Treatment of sharp instrument injuries

If nurses accidentally suffer from sharp instrument injuries and other accidents in the operation and nursing work, effective measures should be taken immediately to extrude the wound, discharge blood from the wound, clean the wound with clean water, and then disinfect the wound with iodine

solution. It is necessary to understand the status of blood-borne infectious diseases in patients, and corresponding inspection measures should be taken to avoid infection if exists. If nurses are stabbed by sharp instruments contaminated by hepatitis B virus, hepatitis B vaccine injection should be performed immediately to prevent the occurrence of hepatitis B infection. In the case of injury due to sharp instrument contaminated by the blood of AIDS-positive patients, the incidence of AIDS can only be reduced as far as possible, and effective drug treatment should be adopted immediately at the same time.

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