Care practices for patient safety in an intensive care unit

Práticas assistenciais para segurança do paciente em unidade de terapia intensiva

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Abstract

Objective: To investigate good nursing care practices for patient safety in an intensive care unit.
Methods: Descriptive study using a checklist with 19 items on hygiene/comfort, patient identification/falls and hospital infection. Four hundred fifty records were analyzed through G test of independence with Williams correction.
Results: Altogether, good care practices are delivered with an index above 90%, exception for position changing, limb restraints kept clean, and ventilator circuit.
Conclusion: Good nursing care practices for patient safety were performed differently based on work shifts.

Resumo

Objetivo: Verificar as boas práticas assistenciais de enfermagem para segurança do paciente em unidade de terapia intensiva.
Métodos: Pesquisa descritiva, utilizando um *checklist* com 19 itens sobre higiene/conforto, identificação do paciente/queda e infecção hospitalar. Foram analisadas 450 verificações por meio do Teste G de independência com a correção de *Williams*.
Resultados: Em conjunto, as boas práticas estão sendo realizadas com índice acima de 90%, com exceção da mudança de decúbito, restrições de membros limpas e circuito do ventilador.
Conclusão: As boas práticas assistenciais de enfermagem para a segurança do paciente foram realizadas, com diversidade conforme o turno de trabalho.

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Introduction

The essence of intensive care nursing is neither in the environment nor in the special devices, but in the decision-making processes based on the understanding of patients' physiological and psychological conditions, with an emphasis on safe care.[1,2] The occurrence of care-related iatrogenic events endangers patients' lives and has gained nurses' attention in order to ensure minimal risk care.[1] Investigations on safe practices concern nurses because research still does not indicate a specific approach to the challenges of safety in nursing.[3]

Healthcare free from risks and failures is a goal to be reached by health professionals and a commitment of professional education.[4] It is not different for the nursing team, since errors may occur that require immediate nursing actions in order to correct them, a situation that inevitably creates occupational stress.[5] Nurses working over 12.5 consecutive hours are more prone to error, especially at the end of the work shift and when performing multiple tasks.[6]

Professionals who work beyond the time period mentioned are more exposed to the risk of error, and the longer the shift the greater the number of accidents.[7] In the intensive care unit, where patients' clinical conditions range between narrow limits of normality/abnormality, where small organic changes can lead to severe impairment of body functions, the risk is greater.[2,8] The occurrence of errors is not only undesirable, but also harmful, thereby the issue of care safety and the context in which care is delivered is inevitably related to the assessment of health services.[9]

Nursing work in the intensive care unit is described as stressful, wearing, fatiguing and overloading, especially regarding the working hours and the environment.[10,11] Patient safety is related to changes in the work process, i.e., the way humans produce and reproduce their existence, interfering with the way that nurses perform their daily work.[3,12] These professionals aim to organize nursing work and human resources, with the purpose of creating and implementing appropriate conditions for patient care.

Comprehensive care refers to a mode of nursing work organization, in which a worker provides all nursing care to a patient or group of patients; however it does not ensure integration of nursing work alone, as pointed out by a study at a teaching hospital of Santa Catarina. Attention to the complexity of care also requires workers' participation in care planning, aimed at patient safety.[9]

Care evaluation is an important tool in the control of work processes in healthcare.[13] In the intensive care unit, the expectation is to ensure the best result within patients' clinical conditions and severity, with the lowest possible rates of procedure-related complications.[14,15]

Errors represent a sad healthcare reality with serious consequences for patients, professionals and hospital organizations. The nursing team must have a magnified view of patients, their security processes and systems, mainly to guarantee security and quality of the process under their responsibility, seeking information about the flow of their activities, about issues with the environment and human resources, as well as knowledge about medications, medication interactions, etc., contributing to the efficient, responsible and safe accomplishment of nursing care.[15]

Because of the complexity of nursing care, its evaluation is necessary, since greater attention to those aspects can prompt care that avoids patient harm. The aim of the study was to investigate good nursing care practices for patient safety in intensive care units (ICUs).

Methods

This was a longitudinal, prospective study seeking correlation between variables by means of repeated observations of the same items over a period of time, based on the extent of subject exposure during events and segments.[16] The study was performed in a general university hospital northwest of São Paulo, with 800 beds. Data were collected in three ICUs: (1) cardiology, (2) neurology, and (3) general. These units were divided into surgical and clinical ICUs. The

surgical ICU had ten beds for patients for delivery of intensive postoperative care after major surgery or due to surgical complications. The clinical ICU also had ten beds for intensive care delivered to patients admitted with diagnoses from all specialties.

The sample consisted of 450 observations, 50 assessments performed in each work period. Patients not allowed to perform the proposed actions during assessment were excluded. A checklist was used as an instrument based on quality of care evaluation through bedside checking of good care practices, validated and completed by the researcher three times a week on alternate periods (morning/afternoon/evening) by watching the bedside nursing actions related to patient care, considering the quality indicators.

The instrument consisted of three items: hygiene and comfort; identification/prevention of falls, and control/prevention of hospital infection, subdivided into 19 sub-items: tidy bed, position changing, presence of egg crate mattress, patient sitting in armchair, side rails elevated and locked, clean limb restraints without joint circulation restriction, head of the bed elevated above 30°, ventilator circuit identified with date of exchange, ambu circuit protected with plastic bag, date recorded on central catheter dressing and/or peripheral venous access, IV sets identified with dates, infusion pumps identified with medication names, three-way taps protected with "luer-cone", urinary catheter properly secured on the thigh, identified bed, identification bracelet on the left arm, ventilator circuit without presence of condensate, urine collection bag below the bladder level, and individual bottle to discard urine.

The results were analyzed by G test of independence with Williams correction, which has the same characteristics of x^2. Excel® software was used to correlate data by means of clusters in different subgroups through percentages and statistical calculations.

The study abided by the national and international standards of research ethics involving human beings.

Results

In Intensive Care Unit 1: comparing the work shifts regarding hygiene and comfort, the item with the highest disagreement was "position changing".. During morning and evening periods, 32 (64%) were correct, whereas in the afternoon, only 26 (52%) were correct. Regarding identification, the item that most differed from one shift to another was "infusion pumps". In the morning period, 49 (98%) were identified and only one (2%) was not. In the afternoon, 47 (94%) were identified and three (6%) were not. In the evening, 39 (78%) were identified and 11 (22%) were not.

Concerning control of hospital infection, as for the item "identified ventilator circuit", 31 (62%) were correct in the morning, 42 (84%) in the afternoon, and 46 (92%) in the evening. Regarding the date of circuit exchange, there was also a significant difference, because in the morning 42 (84%) were identified, 48 (96%) in the afternoon and 37 (74%) in the evening.

In Intensive Care Unit 2: regarding hygiene and comfort, the item with the highest disagreement comparing work shifts was "position changing". In the morning, 19 (38%) had correct position change, 17 (34%) in the afternoon, and 15 (30%) in the evening. Concerning identification, the item "infusion pumps" proved to be different. In the morning, 32 (64%) patients had their pumps identified, 41 (82%) in the afternoon, and 35 (71%) in the evening.

With regard to control of hospital infection, the item "correct fixation of indwelling catheters" had different results when shifts were compared. In the morning, 41 (82%) catheters were correctly fixed, 40 in the afternoon (80%), and 30 (60%) in the evening.

In Intensive Care Unit 3: in relation to hygiene and comfort, "position changing" was also the item that most differed among work shifts. In the morning, 49 (98%) were correct, 41 in the afternoon (82%), and 32 (64%) in the evening. With reference to identification, the item "ventilator circuit" was discrepant. In the morning, 47 (94%) were identified, 30 in the afternoon (60%) and 22 (44%) in the evening.

As for control of hospital infection, "correct fixation of indwelling catheters" was the item with the highest discrepancy comparing shifts. In the morning, 41(82%) catheters were correctly fixed,

Table 1. Items observed in patients hospitalized in Intensive Care Units 1, 2 and 3

Variables	ICU 1		ICU 2		ICU 3	
	Yes(%)	No(%)	Yes(%)	No(%)	Yes(%)	No(%)
Hygiene and comfort						
Tidy bed	137(91.3)	13(8.6)	147(98)	3(2)	130(86.6)	20(13.4)
Position change	90(60)	60(40)	51(34)	99(66)	122(81.3)	28(18.7)
Egg crate mattress	139(92.6)	11(7.3)	145(96.6)	5(3.3)	142(94.6)	8(5.4)
Patient sitting safely	139(92.6)	11(7.4)	148(98.6)	2(1.4)	138(92)	12(8)
Identification/fall prevention						
Side rails elevated	142(94.6)	8(5.4)	143(95.3)	7(4.7)	139(92.6)	11(7.4)
Clean limb restraints	136(90.6)	14(9.4)	113(75.3)	37(24.7)	90(60)	60(40)
Identified bed	144(96)	6(4)	148(98.6)	2(1.4)	145(96.6)	5(3.4)
Identification bracelet	141(94)	9(6)	124(82.6)	26(17.4)	138(92)	12(8)
Identified infusion pumps	135(90)	15(10)	108(72)	42(28)	141(94)	9(6)
Control of hospital infection						
Head of the bed elevated	141(94)	9(6)	139(92.6)	11(7.4)	140(93.3)	10(6.7)
Identified ventilator circuit	119(79.3)	31(20.4)	76(50.6)	74(49.4)	99(66)	51(44)
Protected ambu	120(80)	30(20)	128(85.3)	22(14.7)	101(67.3)	49(32.7)
Date of central catheter exchange	127(84.6)	23(15.4)	140(93.3)	10(6.7)	130(86.6)	20(13.4)
Date of IV set exchange	127(84.6)	23(15.4)	146(97.3)	4(2.7)	136(90.6)	14(9.4)
Protected 3-way taps	142(94.6)	8(5.4)	144(96)	6(4)	143(95.3)	7(4.7)
Indwelling catheter correctly fixed	141(94)	9(6)	111(74)	39(26)	125(83.3)	25(16.7)
Ventilator circuit without condensate	141(94)	9(6)	139(92.6)	11(7.4)	123(82)	27(18)
Urine collection bag below the bladder level	149(99.3)	1(0.7)	149(99.3)	1(0.7)	147(98)	3(2)
Individual bottle to discard urine	150(100)	-(-)	150(100)	-(-)	150(100)	-(-)

Considering the percentage of comparison for 50 patients in each item observed and each shift, with n=50 (100%), according to test G of independence with Williams correlation

40 (80%) in the afternoon, and 30 (60%) in the evening. Regarding protected ambus, 42 (84%) were protected in the morning, 30 (60%) in the afternoon, and 29 (58%) in the evening.

Concerning hygiene and comfort, the item "position change" was the most different among shifts. In ICU 2, only 51 (34%) had position change correctly performed, whereas in ICU 3, there were 122 (81.3%). As for identification, the item "clean restraints" had the highest difference. In ICU 1, 136 (90.6%) were clean, and in ICU 3, only 90 (60%).

Regarding control of hospital infection, the item "identified ventilator circuit" was the most discrepant, especially between ICUs 1 and 2. In ICU 1, 119 (79.3%) were identified, and in ICU 2, 76 (70.6%). Most items observed were correct, which depicts good results; as for hygiene and comfort, the item "presence of egg crate mattress" was 139 (92.6%) in ICU 1, 145 (96.6%) in ICU 2, and 142 (94.6%) in the ICU 3.

Regarding identification and fall prevention, the item "patient sitting in armchair safely" was correct in 139 (92.6%) cases in ICUs 1 and 3, and in 148 (98.6%) cases in ICU 2.. In the control of hospital infection, the item "head of the bed elevated" stood out as a good practice in all ICUs, because in ICU 1, 141 (94%) were correct, 139 (92.6%) in ICU 2 and 140 (93.3%) in ICU 3, demonstrating attention of the nursing team to pneumonia prevention (Table 1).

Discussion

Comparing the way to work in three shifts in the ICUs regarding hygiene and comfort, there was significant difference in the item "position change", with relevant significance ($p<0.01$). This care practice is important for the patient, because it minimizes complications mainly associated with mechanical ventilation and skin integrity, therefore it cannot be overlooked. A Brazilian study found that 40% of the professionals involved in care believed that pressure ulcers occurred due to patients' hemodynamic instability and complexity, 27% believed they occurred due to staff shortage, which directly affected

changing of position, and 20% believed they occurred due to incorrect care delivery by the nursing team.[17] Those reasons may be involved with the findings of this study, since position change was the care practice with the lowest rates of delivery in all ICUs.

The items "tidy bed" and "presence of egg crate mattress" to prevent pressure ulcers were present in the three units for approximately 90% of patients. This care practice is part of pressure ulcer prevention, which has implications for patients' prognosis and outcome and impact on hospitalization costs, which corroborates a study that found an increase in the length of hospital stay by approximately 6% among patients with pressure ulcers.[18,19]

Regarding patient identification, medications used, and fall prevention, the item "clean, dry limb restraint without arm and leg circulation restriction" obtained a relatively high level of significance when the ICUs were compared ($p<0.01$). Studies show that nurses, as members of the multidisciplinary team and leaders of the nursing team in the ICU, should develop safe and effective ways to provide care. Thereby, systematic forms contribute to recognition of the importance of nursing actions at any level of healthcare.[20]

Most (95%) identifications of patient rooms were correct. Concerning the use of the identification bracelet with name, hospital number, mother's name and date of admission, the rate was 89%.

With regard to the control of hospital infection, of the ten items observed, there was disagreement between units in the identification of ventilator circuit exchange, which was 79%, 51% and 66% in ICUs 1, 2 and 3, respectively, exposing the need for greater emphasis on this nursing care activity. Not exchanging the circuit periodically in patients with tracheal tubes significantly increases ventilator-associated pneumonia, and the incidence of respiratory infections by 40%.[21]

In general, it was found that good practices were delivered, with an index above 80% for 15 items, with the best results obtained in ICU 1. Irregularities for the 19 items and for the three shifts were observed. However, a larger number was evidenced in the evening, which may be related to the stressful environment itself and sleep changes presented by professionals who work at night, reflecting on care.[22]

Ensuring the safety of critically ill patients has been a major challenge for professionals working in the intensive care unit because patients undergo many procedures each day, and in some of these activities, errors may occur with the potential to cause harm.[23] As a consequence, hospitals need to incorporate a policy of risk management with focus on education, establishing preventive barriers at all stages of strategic processes, and identify opportunities to improve care.[22]

This study demonstrated that the only care performed 100% was the use of an individual bottle to discard urine. The items performed 90% or more in the three units were: egg crate mattress, patient sitting, side rails elevated, bed identification, head of the bed elevated above 30°, three-way taps protected with "luer cone", and urine collection bag below the bladder level. Therefore, nurses should take into account the risks when planning care, ensuring and supervising the team, particularly in relation to care, for the improvement of assistance, minimizing of errors and indiscretions.[24]

Conclusion

Good nursing care practices related to patient safety were delivered in the three units. In an isolated view, care delivery was different in the shifts. Altogether, significant differences were found between ICUs. However, position changing, limb restraints and identification of the mechanical ventilator circuit had the same profile among units, with lower rates of performance.

Collaborations

Barbosa TP contributed to the project design, research execution and article writing. Oliveira GAA contributed to data collection. Lopes MNA contrib-

uted to the project design. Poletti NAA contributed to data analysis and article writing. Beccaria LM contributed to the project design, article writing, relevant critical review of its intellectual content, and the approval of the final version to be published.

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