Am J Transl Res 2021;13(6):7406-7411
www.ajtr.org /ISSN:1943-8141/AJTR0131401

Original Article

The effect of the prospective information-based nursing quality management model on the improvement of management quality in emergency medicine nursing management

Qian Dong[1], Yi Zhang[2]

[1]*Internal Medicine, Lixia District People's Hospital of Jinan City, Jinan 250000, Shandong Province, China;*
[2]*Department of Outpatient, Shandong Provincial Third Hospital, Jinan 250031, Shandong Province, China*

Received February 4, 2021; Accepted February 25, 2021; Epub June 15, 2021; Published June 30, 2021

Abstract: Objective: This study aimed to explore the clinical effectiveness of applying a prospective information-based nursing quality management model in emergency medicine nursing management and its impact on the management quality. Methods: 170 inpatients treated in the emergency department of our hospital from April 2018 to March 2019 were recruited as the study cohort and randomly divided into a control group and a study group, with 85 patients in each group. In the study, the patients in the control group were treated using the routine nursing mode, and the patients in the study group were treated using the prospective information-based nursing quality management model to compare the nursing management quality, the nursing satisfaction, the occurrence of adverse events, the nursing compliance, the emergency response times, and the survival rates between the two groups. Results: We found that the overall nursing management quality in the study group was better than it was in the control group. The nursing satisfaction rate in the study group (96.47%) was higher than the nursing satisfaction rate in the control group (83.53%) The rate of adverse events in the study group (5.88%) was lower than it was in the control group (16.47%), the nursing compliance rate in the study group (89.41%) was higher than it was in the control group (63.53%), the emergency response times in the study group were shorter than they were in the control group, and the postoperative survival rate in the study group was higher than it was in the control group, all with statistically significant differences ($P<0.05$). Conclusion: The prospective information-based nursing quality management model has a significant influence on emergency medicine nursing management. It can significantly improve the nursing management quality, the patients' satisfaction with the nursing process, and the nursing compliance, and it can effectively avoid adverse events, so it is worthy of promotion.

Keywords: Prospective information-based nursing quality management model, emergency internal medicine, nursing management, management quality

Introduction

In general, emergency departments assign patients with extremely serious conditions to be treated in a specific department. The treatment in emergency medicine departments is characterized by unstable visiting times, a variable number of patients, various diseases, and a wide range of professions involved, etc. Therefore, traditional nursing services are increasingly unable to meet the clinical needs of emergency medicine departments [1]. A new management model, the prospective information-based nursing quality management model, emphasizes the connotation of service, safety, quality, etc., and introduces the network information platform into modern medical services to formulate accurate and scientific nursing strategies, providing patients with simple, convenient, fast, high-quality, and efficient medical nursing services [2]. In order to further discuss the clinical effect of the prospective information-based nursing quality management model in the nursing management of emergency medicine and its impact on management quality, the study recruited 170 patients treated in the

Table 1. Comparison of the general data

Group	Gender (Male/Female)	Age ($\bar{x}$ ± s, y)	Time from onset to consultation ($\bar{x}$ ± s, min)
Study group (n=85)	41/44	60.51±5.74	72.57±4.78
Control group (n=85)	42/43	61.82±5.72	73.21±4.85
χ^2/t	0.024	1.490	0.866
P	0.878	0.138	0.388

emergency department of our hospital from April 2018 to March 2019 as the cohort, and our study is reported as follows.

Materials and methods

General information

170 patients with acute myocardial infarction (AMI) treated in our hospital from April 2018 to March 2019 were recruited as the study cohort, excluding the patients with an unclear expression of their complaints and patients with other serious diseases, but including the patients who met the inclusion criteria. According to the sequence of their admission, they were divided into a control group and a study group, with 85 cases in each group. The control group underwent treatment using the routine nursing mode, and the study group underwent treatment incorporating the prospective information-based nursing quality management model. The study was approved by Ethics Committee of First hospital of Shandong Medical University, approval no. K698201712. There were no significant differences in terms of gender, age, or consultation hours between the two groups (P>0.05), as shown in **Table 1**.

Methods

The control group underwent treatment incorporating the routine nursing mode, including the improvement of the handover between the ambulance crew and the emergency room, real-time monitoring of each patient's condition, oxygen inhalation nursing, electrocardiograph (ECG) monitoring, and the improvement of related work before triage [3].

In the meantime, the patients in the study group were treated according to the prospective information-based nursing quality management model. First, a quality management team was established, which consisted of internal medicine professionals, nursing staff, and information backstage management personnel [4]. Internal medicine and the nursing staff discussed and analyzed the influencing factors of the emergency problems and formulated a scientific and feasible nursing program [5]. The background management personnel used a Wechat Group, Wechat official accounts and other information platforms to digitize and automate the departmental system, the clinical data, and the nursing process details for information sharing [6]. Internal medical nursing materials were published regularly for staff to browse and learn about the necessary precautions during the treatment [7]. Second, the reception and nursing departments were strengthened. First aid items were prepared in advance, and the ambulance departed promptly after receiving an emergency call [8]. The patient's family members were asked about the patient's pathogenesis, current vital signs, past medical history, drug allergy history, etc [9]. Upon arrival at the scene, first aid was carried out quickly, and oxygen support and ECG monitoring were provided to the patients [10]. For patients experiencing cardiac arrest, cardiopulmonary resuscitation was performed. Oral analgesics or morphine injections were used with the patients experiencing strong pain [11]. Third, the in-hospital nursing was strengthened. After the patients arrived at the emergency room, the triage nurses carried out the nursing management and triage [12]. The three-way physician examination system was implemented, including a resident doctor, an attending doctor, and a chief physician on the spot, and the patients were triaged according to the severity their illnesses [13]. Communication with the relevant departments was maintained to reasonably predict the changes in each patient's condition and make preparations for first aid in advance [14]. Fourth, the ward nursing was strengthened. The patients were kept in a comfortable position. The ward temperatures, humidity, and other environmental factors were adjusted. The patients' vital signs were closely monitored, and their complaints were noted [15]. Each patient's physical characteristics, medical records, and other data were charted. In addition, the nurses did well in the handovers [16].

Table 2. Nursing management quality ($\bar{x}$ ± s, point)

Group	Primary Care Score	Critical Care Score	Holistic Care Score	Ward Management Score
Study group (n=85)	94.57±3.97	93.67±3.29	93.49±3.26	92.87±3.51
Control group (n=85)	84.91±3.76	83.24±3.36	82.29±3.93	83.86±3.47
t	16.288	20.449	20.223	16.830
P	<0.001	<0.001	<0.001	<0.001

Table 3. Nursing satisfaction [n, (%)]

Group	Very Satisfied	Satisfied	Dissatisfied	Total Satisfaction
Study group (n=85)	59 (69.41)	23 (27.06)	3 (3.53)	82 (96.47)
Control group (n=85)	44 (51.77)	27 (31.76)	14 (16.47)	71 (83.53)
χ^2				7.909
P				0.005

Observational indexes

The study compared the two groups in terms of their nursing management quality scores, including primary care, critical care, holistic care, and ward management, each with a total possible score of 100 points, and the higher the score, the better the nursing management quality. The nursing satisfaction was also compared. An in-house, self-made questionnaire was used to evaluate the information and education, the psychological counseling effect and the self-care awareness, evaluating on three levels: very satisfied, satisfied, and dissatisfied. The total satisfaction rate = (the "very satisfied" cases + the "satisfied" cases)/total cases * 100%. The occurrences of adverse events in the intervention process were compared, and the occurrences of accidents, disputes, and complaints in the nursing process were investigated and counted. The nursing compliance was compared and evaluated based on the on-time delivery of the medication, the doctor-patient communication, and the psychological resistance, including complete compliance, partial compliance, and non-compliance. The emergency response times and survival rates of the two groups were observed.

Statistical methods

The data were processed using SPSS 22.0. All the measurement data were expressed as [n, %], and the differences between the groups were tested using X^2. The measurement data were expressed as ($\bar{x}$ ± s), and the differences between groups were measured using T tests. A difference between the two groups was statistically significant when P<0.05.

Results

Nursing management quality

In the study group, the primary care score was (94.57±3.97), the critical care score (93.67±3.29), the holistic care score (93.49±3.26) and the ward management score (92.87±3.51). In the control group, the primary care score was (84.91±3.76), the critical care score (83.24±3.36), the holistic care score (82.29±3.93) and the ward management score (83.86±3.47). The nursing management quality of the study group was better than the nursing management quality of the control group, with a statistically significant difference (P<0.05), as shown in **Table 2**.

The nursing satisfaction

The study group had 59 patients giving a rating of "very satisfied", 23 giving a rating of "basically satisfied", and 3 patients giving a rating of "dissatisfied", for a total satisfaction rate of 96.47%. The control group had 44 patients giving a rating of "very satisfied", 27 patients giving a rating of "basically satisfied", and 14 patients giving a rating of "dissatisfied", for a total satisfaction rate of 83.53%. The nursing satisfaction rate in the study group was higher than it was in the control group, with a statistically significant difference (P<0.05), as shown in **Table 3**.

Adverse events

The study group had 3 nursing complaints, 1 nursing dispute, and 1 accident, for an incidence of adverse events of 5.88%. The control

Table 4. Adverse events [n, (%)]

Group	Nursing Complaints	Nursing Dispute	Accident	Total Satisfaction
Study group (n=85)	3 (3.53)	1 (1.12)	1 (1.12)	5 (5.88)
Control group (n=85)	5 (5.88)	3 (3.53)	6 (7.06)	14 (16.47)
χ^2				4.799
P				0.028

Table 5. Nursing compliance [n, (%)]

Group	Complete Compliance	Partial Compliance	Non-Compliance	Total Compliance Rate
Study group (n=85)	55 (64.71)	21 (24.71)	9 (10.59)	76 (89.41)
Control group (n=85)	25 (29.41)	29 (34.12)	31 (36.47)	54(63.53)
χ^2				15.82
P				<0.001

Table 6. Comparison of the emergency response times and survival rates

Group	Emergency response time (min)	Survival rate [n, (%)]
Study group (n=85)	79.07±9.32	82 (96.47)
Control group (n=85)	119.75±20.51	73 (85.88)
t/χ^2	16.648	5.923
P	<0.001	0.015

group had 5 nursing complaints, 3 nursing disputes, and 6 accidents, for an incidence of adverse events of 16.47%. The incidence of adverse events in the study group was lower than it was in the control group, with a statistically significant difference (P<0.05), as shown in **Table 4**.

The nursing compliance

The study group had 55 cases of complete compliance, 21 cases of partial compliance and 9 cases of non-compliance, for a total compliance rate of 89.41%. The control group had 25 cases of complete compliance, 29 cases of partial compliance, and 31 cases of non-compliance, for a total compliance rate of 63.53%. The nursing compliance in the study group was better than the nursing compliance in the control group, with a statistically significant difference (P<0.05), as shown in **Table 5**.

The emergency response times and survival rates in the two groups

After the intervention, the study group had shorter emergency response times and higher survival rates compared to the control group, with statistically significant differences (P<0.05), as shown in **Table 6**.

Discussion

Modern emergency medicine often involves a large emergency medical center integrating emergency treatment, first aid, and intensive care. Emergency medicine provides a wide range of services, including diagnosis and treatment, and covering respiratory failure, pleural effusions, the exacerbation of chronic obstructive pulmonary disease (COPD), etc. Undoubtedly, the patients' conditions in emergency medicine departments are complex and may change at any time. Various factors make the routine nursing management mode unable to meet the needs of current nursing in emergency internal medicine departments [17]. As emergency medicine nursing is risky, an insufficient prognosis of the disease and rash measures will lead to passive rescue work, having a negative effect on patient prognosis [18]. A new type of nursing management model, prospective information-based nursing gives full play to the advantages of knowledge and information management, focusing on planning prospectively and on information technology. Modern information platforms such as Wechat can realize more convenient communication with patients to make nursing measures more predictable. Relevant clinical studies have proved that the prospective information-based nursing quality management model can effectively avoid nursing risks and improve the nursing quality by comprehensively and scientifically demonstrating the patients' conditions [19].

The results of this study showed that the study group outperformed the control group on overall nursing management levels and nursing satisfaction rates (96.47%), the incidence of adverse events (5.88%), the nursing compliance (89.41%), the emergency response times, and the postoperative survival rate, with statistically significant differences (P<0.05), which is consistent with findings of Xiang-Hua [20] whose study showed that the nursing quality indicators such as primary nursing (97.04± 1.42), nursing safety (97.32±1.92), ward management (95.71±0.52), and nursing documentation (97.23±2.31) of the nurses were substantially improved after the implementation of the prospective nursing management model, with significant differences and clinical comparative value (P<0.05). That study concluded that the implementation of prospective nursing quality management can improve the nursing quality, and ensures the safety of the nursing operation and nursing standardization with a significant therapeutic effect. Therefore, prospective nursing quality management can greatly improve the nursing management levels and work quality of emergency medicine and has a good clinical effectiveness.

In conclusion, the prospective information-based nursing quality management model has a good clinical effectiveness in emergency medicine nursing management, and it has great significance in improving nursing management quality and nursing satisfaction with effective control of the occurrence of adverse events' such as nursing disputes, so it is worthy of vigorous promotion in clinical practice.

Disclosure of conflict of interest

None.

Address correspondence to: Yi Zhang, Department of Outpatient, Shandong Provincial Third Hospital, No. 12 Wuyingshan Middle Road, Tianqiao District, Jinan 250031, Shandong Province, China. Tel: +86-0531-85959955; E-mail: jinanzhangyi@163.com

References

[1] Li T, Ding W, Li X and Lin A. Mobile health technology (WeChat) for the hierarchical management of community hypertension: protocol for a cluster randomized controlled trial. Patient Prefer Adherence 2019; 13: 1339-1352.

[2] Wang T, Yan J, Ma J, Li F, Liu C, Cai Y, Chen S, Zeng J and Qi Y. A fuzzy comprehensive assessment and hierarchical management system for urban lake health: a case study on the lakes in Wuhan City, Hubei Province, China. Int J Environ Res Public Health 2018; 15: 2617.

[3] Johnson KD, Gillespie GL and Vance K. Effects of interruptions on triage process in emergency department: a prospective, observational study. J Nurs Care Qual 2018; 33: 375-381.

[4] Zhou P, Jin B, Li H and Huang SY. HPEPDOCK: a web server for blind peptide-protein docking based on a hierarchical algorithm. Nucleic Acids Res 2018; 46: W443-W450.

[5] Havaei F, MacPhee M and Dahinten VS. The effect of nursing care delivery models on quality and safety outcomes of care: a cross-sectional survey study of medical-surgical nurses. J Adv Nurs 2019; 75: 2144-2155.

[6] Zhang Q, Liu Y, Zhao Y and Wang N. A multimode operation control strategy for flexible microgrid based on sliding-mode direct voltage and hierarchical controls. ISA Trans 2016; 61: 188-198.

[7] Bellucci G, Camilleri JA, Iyengar V, Eickhoff SB and Krueger F. The emerging neuroscience of social punishment: meta-analytic evidence. Neurosci Biobehav Rev 2020; 113: 426-439.

[8] Liu T, Bai XJ. Trauma care system in China. Chin J Traumatol 2018; 21: 80-83.

[9] Eshete MT, Baeumler PI, Siebeck M, Tesfaye M, Haileamlak A, Michael GG, Ayele Y and Irnich D. Quality of postoperative pain management in Ethiopia: a prospective longitudinal study. PLoS One 2019; 14: e0215563.

[10] Haroutounian S, Ratz Y, Ginosar Y, Furmanov K, Saifi F, Meidan R and Davidson E. The effect of medicinal cannabis on pain and quality-of-life outcomes in chronic pain: a prospective open-label study. Clin J Pain 2016; 32: 1036-1043.

[11] Lehmkuhl D, Meissner W and Neugebauer EA. Evaluation of the "initiative pain-free clinic" for quality improvement in postoperative pain management. A prospective controlled study. Schmerz 2011; 25: 508-15.

[12] Sloane DM, Smith HL, McHugh MD and Aiken LH. Effect of changes in hospital nursing resources on improvements in patient safety and quality of care: a panel study. Med Care 2018; 56: 1001-1008.

[13] Hackett J, Godfrey M and Bennett MI. Patient and caregiver perspectives on managing pain in advanced cancer: a qualitative longitudinal study. Palliat Med 2016; 30: 711-9.

[14] Doherty M, Jenkins W, Richardson H, Sarmanova A, Abhishek A, Ashton D, Barclay C, Doherty S, Duley L, Hatton R, Rees F, Stevenson M and Zhang W. Efficacy and cost-effec-

tiveness of nurse-led care involving education and engagement of patients and a treat-to-target urate-lowering strategy versus usual care for gout: a randomised controlled trial. Lancet 2018; 392: 1403-1412.

[15] Leigheb M, Sabbatini M, Baldrighi M, Hasenboehler EA, Briacca L, Grassi F, Cannas M, Avanzi G and Castello LM. Prospective analysis of pain and pain management in an emergency department. Acta Biomed 2017; 88: 19-30.

[16] Galinski M, Hoffman L, Bregeaud D, Kamboua M, Ageron FX, Rouanet C, Hubert JC, Istria J, Ruscev M, Tazarourte K, Pevirieri F, Lapostolle F and Adnet F. Procedural sedation and analgesia in trauma patients in an out-of-hospital emergency setting: a prospective multicenter observational study. Prehosp Emerg Care 2018; 22: 497-505.

[17] Tan CIC, Liaw JSC, Jiang B, Pothiawala SE, Li H and Leong MKF. Predicting outcomes of acute low back pain patients in emergency department: a prospective observational cohort study. Medicine (Baltimore) 2018; 97: e11247.

[18] Andrès E, Talha S, Hajjam M, Hajjam J, Ervé S and Hajjam A. Experimentation of 2.0 telemedicine in elderly patients with chronic heart failure: a study prospective in 175 patients. Eur J Intern Med 2018; 51: e11-e12.

[19] García-Acosta JM, San Juan-Valdivia RM, Fernández-Martínez AD, Lorenzo-Rocha ND and Castro-Peraza ME. Trans* pregnancy and lactation: a literature review from a nursing perspective. Int J Environ Res Public Health 2019; 17: 44.

[20] Rouleau G, Gagnon MP, Côté J, Payne-Gagnon J, Hudson E and Dubois CA. Impact of information and communication technologies on nursing care: results of an overview of systematic reviews. J Med Internet Res 2017; 19: e122.