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Problem Solving for Volatilizing Situation in Nursing: Developing Thinking Process Supporting System using NursingNAVI® Contents

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Abstract. We have identified three foci of the nursing observation and nursing action respectively. Using these frameworks, we have developed the structured knowledge model for a number of diseases and medical interventions. We developed this structure based NursingNAVI® contents collaborated with some quality centered hospitals. Authors analysed the nursing care documentations of post-gastrectomy patients in light of the standardized nursing care plan in the "NursingNAVI®" developed by ourselves and revealed the "failure to observe" and "failure to document", which leaded to the volatility of the patients' data, conditions and some situation. This phenomenon should have been avoided if nurses had employed a standardized nursing care plan. So, we developed thinking process support system for planning, delivering, recording and evaluating in daily nursing using NursingNAVI® contents. A hospital decided to use NursingNAVI® contents in HIS. It was suggested that the system has availability for nursing OJT and time reduction of planning and recording without volatilizing situation.

Keywords. Knowledge and use, quality assurance, nursing informatics, structured knowledge, thinking process, professional judgment

Introduction

Nursing's target is the patients' conditions and their situation which surrounds them (e.g. healthcare providers, hospital facilities and administration, and healthcare system as a whole). Nursing process complies fully with the PDCA cycle for quality assurance: nurses develop patient care plans, implement them, evaluate the outcome and proceed to next planning and implementation. In this process, nursing observation and nursing action are two major factors, which should be implemented and then documented duly for quality nursing.

However, our previous study [1] showed that nurses often failed in observing the patients' conditions and their situations (observation failure), in implementing nursing action as planned (implementation failure), or in documenting what they observed or implemented (documentation failure). These failures lead to the significant information loss, causing the nursing process less satisfying. We name this phenomenon "volatilizing situation".

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In this study, we identified such volatilizing situation focusing on the nurses' observation failure concerning the post-gastrectomy patients, as well as develop and introduce a thinking process supporting system using NursingNAVI® contents.

1. Methods

We have developed a tool named the "NursingNAVI®", including the items for nursing observation and nursing action, together with a number of standardized nursing care plans such as one for post-gastrectomy conditions (Table 1).

"NursingNAVI®" is a set of standardized nursing care plans, which is made up of the standardized terminology for nursing . The standardized terminology, the Master File of Standardized Nursing Practice Terminology has been also developed by a team of nurses including authors and contains 2,831 terms for nursing observation and 2,638 terms for nursing action [2].

Each plan has been built up and refined by the first line practicing nurses, the nurse managers, the peer review teams and the nursing informatics specialists. It consists of three parts: "diagnostic testing and medical procedure", "nursing observation" and "nursing action". In "diagnostic testing and medical procedure", we describe the medical procedures, prescriptions and medical orders made by the physicians for the patient. In "nursing observation" and "nursing action", we describe what nurses should observe and implement for the patient [3] [4].

Table 1. The "NursingNAVI" for the post-gastrectomy patients (partial view)

Diagnostic testing and therapy						
(1st day) WBC, Blood biochemistry						
Oxygen therapy, Intermittent pneumatic compression, Plophylactic antibiotics, Infusion therapy, Epidural catheter (PCA),						

Nursing observation						
Major category	S	C	A	Code	Observation item	Unit
Vital signs	✓	✓	✓	31001848	BP: systolic	mmHg
	✓	✓	✓	31001849	BP: diastolic	mmHg
	✓	✓	✓	31001390	Pulse rate	rate/ min.
	✓	✓	✓	31001368	Body temperature	C
	✓	✓	✓	31001369	Respiratory rate	rate/ min
	✓	✓	✓	31000001	SpO2	%
Intake & output		✓	✓	31000014	Infusion volume	ml
		✓	✓	31000018	Total intake	ml
	✓	✓	✓	31000021	Urine volume	ml
	✓	✓		31000029	Bowel movement	rate/ day
	✓	✓	✓	31000027	Urination	rate/ day
		✓		31000294	Bleeding	ml
	✓	✓		31000072	Drainage: NG tube	ml
		✓		31000257	Drainage: anastomosis site	ml
		✓		31002499	Drainage: subphrenic	ml
	✓	✓	✓	31000041	Vomiting	rate/ day
	✓	✓	✓	31000040	Amount of vomit	ml
Signs & symptoms, Systematic assessment		✓	✓	31001657	Consciousness(JCS)	
		✓	✓	31001620	Consciousness(GCS-E)	
		✓	✓	31001621	Consciousness(GCS-M)	
		✓	✓	31001622	Consciousness(GCS-V)	
		✓	✓	31001627	Unbalanced chest movement	
		✓	✓	31001946	dyspnea	
		✓	✓	31000541	Weakened breath sound	
		✓	✓	31000533	Abnormal breath sound	
		✓	✓	31000535	Abnormal breath rhythm	

S: Signs and symptoms caused by the disease, C: Complications caused by invasive medical procedures, A: Adverse effects of the drugs

Chart review of the five patients in post-gastrectomy conditions in four hospitals was performed to see what the nurses actually observed. In each unit, the nurse

manager selected one or two patient(s), who experienced some or other post surgical complications. Through the chart review, the nurse managers, together with the authors, tried to identify if there was any difference between the observation items in the standard care plan, namely the "NursingNAVI®" and the actual observation put documented each individual patient's nursing record. In addition, when the observation items in the "NursingNAVI®" were not fully documented by the nurses, the nurse managers tried to find out through interviewing the nurses whether they did not perform the observation at all (observation failure), or they failed to make documentation though having performed the observation (documentation failure). Data were collected just after the patients had been discharged.

Authors analysed the nursing care documentations of post-gastrectomy patients in light of the standardized nursing care plan in the "NursingNAVI®" developed by ourselves and revealed the "failure to observe" and "failure to document", which leaded to the volatility of the patients' data, conditions and some situation.

2. Results

All the patients were taken care of at middle to large size hospitals. They were either in the general unit, HCU or ICU. There were slight variation in their surgical procedures, but they all experienced post surgical complications such as ruptured suture or dumping syndrome. They were wearing some kinds of tube and/ or drains, e.g. the naso-gastric (NG) tube, drainage tubes at the anastomosis site, ones at the subphrenic site (Table 2).

Through the documentation, it was shown that the nurses' success rate to comply with the observation items in the standardized care plan varied greatly across their categories: the standardized care plan puts 88 observation items for the "complications" after surgery, of which nurses actually observed 30 to 61%. Likewise, as for the "signs and symptoms/ systematic assessment", the nurses generally observed less than 60% of the 70 observation items in the standardized care plan. On the other hand, categories such as the "vital signs (6 items)" and the "intake and output (12 items)" showed higher success rate of observations, over 83% and 90% respectively. It was an overall tendency that the documentation of the consciousness, namely the scores of the Japan Coma Scale (JCS) and/ or the Glasgow Coma Scale (GCS), was missing, while the wakefulness after the general anesthesia was documented in all cases. In addition, though nurses observed the abnormal lung sounds, they did not document the areas where such sounds were heard, except for one patient with an underlying respiratory problem.

It was also revealed that the nurses did not record the patients' sense of paralysis and/ or numbness due to anesthesia or immobility even though they observed these symptoms. As for the pain management as well, the nurses observed whether or not the patient had pain in every case, but they did not measure it using such a scale as VAS (visual analogue scale), suggesting the lack of longitudinal assessment and follow up.

As for the management of the tubes and drains, nurses observed their indwelling lengths, but never documented them except for the NG tubes. Generally, there was a wide variety of terms used concerning the tubes and drains as the nurses did not have a standardized terminology to describe them. Thus, they lacked the consistent observation and management of the tubes and drains.

Finally, although the nurses had developed the nursing care plan for each patient in their own manner, there was not much consistency between what was planned and what was actually implemented (observed).

As summarized in Table 3, we recognized three pattern of combination of the standardized care plan, actual observation and documentation, namely, No. 1, 2 and 4. Pattern No. 1 is the valid nursing process where observation is duly implemented as in the standardized plan and then documented duly. Pattern No. 2 is the case where observation was made but not documented. Pattern No. 4 is the case where failure to observe occurred hence there was no documentation. Pattern No. 3 was not recognized but it may occur where a nurse describes the reason why she/ he has not made the observation.

Table 2. Documentation by nurses

Patient ID		**1**	**2**	**3**	**4**	**5**
Hospital profile						
	Hospital	A	B	C	D	D
	No. of beds	590	343	229	238	238
	Unit	General	HCU	ICU	General	General
Patient profile						
	Age	73	78	83	78	71
	Surgical procedure	open-TG	LATG	open-TG	LADG	open-TG
	Complications	RS	DS	RS	RS	RS
	NG tube	+	+	-	+	+
	Drainage: anastomosis site	+	+	+	-	-
	Drainage: subphrenic site	+	-	+	-	+
Observations performed by the nurses: No of items (%)						
	Complications 88 items	34 (39)	51 (61)	33 (38)	40 (56)	26 (30)
	Vital signs 6 items	6 (100)	6 (100)	5 (83)	5 (83)	6 (100)
	Intake-output 12 items	9 (72)	9 (82)	10 (91)	9 (90)	9 (82)
	Signs and symptoms, 70 items	19 (27)	36 (55)	18 (26)	26 (47)	11 (16)

TG: Total gastrectomy, LA: Laparoscopy assisted, DG: Distal gastrectomy, RS: Ruptured suture, DS: Dumping syndrome

Table 3. Flow of nursing process

SP	IP	O	D	No.	Comment
Standardized Plan		+	+	1	Valid nursing process
			-	2	Failure to document
		-	+	(3)	Failure to observe with some record
			-	4	Failure to observe hence no record

IP: Individual plan, O: Observation, D: Documentation

Based on our findings, an acute hospital having 1,116 beds introduced this system using NursingNAVI® contents to prevent volatility in 2014. After six months, nurses could make nursing care plan and documentation more easily, efficiently and reasonably. One of their achievements was that the rate of nurses who took 30 minutes or more for gathering data and information was decreased from 45.8% to 4%.

3. Discussion

Not all the observation items in the standardized care plan were actually observed in their clinical practice. The typical pattern in this case was the “failure to observe”. When it occurs, the data and information concerning the patients’ conditions and their situation gets lost. When such loss occurs, quality of nursing care becomes

compromised because nursing is art and science that is built upon the effort to capture the comprehensive picture of patients and their situations. Data and information is essential element when nurses try to capture such a comprehensive picture of patients' situation. Thus, when any element is missing, the volatility will be caused in some part of the whole picture.

Although nurses developed individual nursing care plan for each patient in their own manner, they did not have any structured or systematic method to construct a care plan which reflects the comprehensive picture of the patient situation. This might be one cause of the missing items of nursing observations, which in turn leads to volatility In addition, some nurses do not seem fully aware of the significance of documentation, which in turn lead to the lack of recording. These elements, namely, insufficient planning and insufficient documentation are the serious causer of volatility of the patients' situations.

As there were only weak relation among the planning, implementation and documentation, we cannot but think documentation alone is not enough to evaluate the nursing process. This is to say, we need much better documentation system that supports PDCA cycle in nursing to go on. In the current clinical settings, it seems difficult to relate the standardized care plans, the individual care plans, implementation, documentation and the evaluation one another as such effort is too costly.

Volatility of the patients' data, conditions and some situation may be prevented by using the structured and standardized nursing care plans and efficient documentation systems.

Standardized care plan such as the "NursingNAVI®" is one of the effective and efficient tools to assure the comprehensiveness of the picture. First, it describes what nurses should observe in a systematic and structured manner, thus enabling them to collect data and information to construct a comprehensive picture of the patients' situations more easily. Secondly, the "NursingNAVI®" may function as a tool for documentation as well, when it is installed into the hospitals' EHR systems. Thus, the nursing observation part of the "NursingNAVI®" shows nurses what they should observe and provides them with a platform for documentation at the same time.

Healthcare including nursing is a service that is provided in response to, thus adaptive to, the patients' conditions and situations. Healthcare providers including nurses are facing the demand of responding the changing patients' needs. In order to assist them responding such needs in a timely manner, tools to support them such as IT systems are of vital importance.

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