

EFFECTIVENESS OF SMALL GROUP TRAINING ON BEHAVIORAL SKILLS OF ICU NURSES

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Abstract. Aim and background: Numerous errors can occur during administration of nutrient-medication orders through feeding tubes. Proper performance of the nurses can enhance the patients' safety and prevent from the future complications. The aim of this study is to evaluate the effect of training in small groups on the performance of nurses in administration of nutrient-medication orders.

Materials and methods: This is an experimental study conducted in Imam Khomeini Hospital of Urmia. 80 nurses were entered to the study by census sampling method. Their knowledge and performance in terms of medication administration were evaluated before and one month after the training program.

Findings: It was observed that before training, the knowledge of the nurses in control group (90.6%) and intervention group (80%) was in weak level. After training, the knowledge state of 97.1% of intervention group's nurses improved to good level. Before training, most of the nurses of both groups showed improper performance. However, training program improved the performance of the nurses in intervention group.

Discussion and conclusion: Some errors may happen during medication administration by feeding tubes which could result in undesirable complications. In this regard, improvement and application of correct medication administration techniques can result in increase of drugs' and diets' effectiveness, patients' safety and reduction of feeding tubes blockage.

Keywords: Small group training, nurse, endoscopic gastric tube, knowledge, gavage, nutrient-drug interaction

INTRODUCCIÓN

Patients are in need of extra care in intensive care unit (ICU) (Heldt T et al., 2013). Patients of ICU often can't fulfill their nutrient needs (Wright-Myrie D et al., 2013). In ICU, the patients are fed by feeding tubes (Zoni MLG et al., 2016).

In addition to food gavage, nurses can administer medication orders by feeding tubes, correct drug delivery by feeding tubes requires the knowledge on different forms of drugs, possibility of their administration by feeding tubes and proper use of the relevant techniques (Mota MLS et al., 2010). Some drug forms, such as coated tablets, can be crushed and administrated by feeding tubes. But the slow-release tablets or entric-coated ones can't be crushed. Crushing of these types of tablets will destroy their properties and can be effective in therapy failure or toxicity (Dashti-Khavidaki S et al., 2012). Crushed tablets are the common reasons of feeding tubes blockage (Seifert C et al., 2005; Belknap D et al., 1997). Such blockage can occur in 8.3% of cases (Matsuba C et al., 2007). Possible interactions can also destroy the medication or food function. Health care team should be cautious and evaluate the possible nutrient-medication interactions (Williams NT et al., 2007).

In the study of Zhu et al, 60% of nurses had adequate knowledge on medication forms and 30% of them were aware of medication crushing or opening. 80% of the nurses administrated all medications of the patient simultaneously through nasogastric tube by the same syringe (Zhu L-L et al., 2012).

ICU staffs should have strong knowledge and scientific background (Mohamadi G et al., 2009). One of the methods to enhance the knowledge and reinforce the skills is training. Small group training is one the effective educational routes (Safari M et al., 2004).

Small group training is an organized and regular dialogue between a limited number of people who have common and mutual objectives (Fischer RL et al., 2004). This educational method let people discuss about their thoughts and experiences and the learners will have a lot of opportunities for thinking, analysis and evaluate their new

knowledge and solve the clinical problems. In this regard, this method can enhance the critical thinking of the learners (Sanasuttipun W et al., 2009).

Regarding the effects of incorrect medication administration by feeding tubes and low knowledge of nurses, the present study was conducted with the aim of investigating the effectiveness of small group training on medication administration performance of the nurses through endoscopic gastric tube intubation in ICU of Imam Khomeini Hospital of Urmia in 2014.

MATERIALS AND METHODS

This is a clinical trial by which the effect of training on nurses' performance in nutrient-medication administration by feeding tubes was investigated. After obtaining Urmia Medical Science ethnical committee approval (umsu.rec.1393.36), the researcher referred to Imam Khomeini Hospital of Urmia for coordination with hospital authorities. For lowering the costs and also due to the small population volume, the sampling was done by census sampling and all the ICU nurses of Imam Khomeini Hospital were included in the study. In 2014, 92 nurses were working in ICU of Imam Khomeini Hospital of Urmia city. Regarding the inclusion (clinical nurses of ICU and all nurses with bachelor and master degrees in any nursing branches) and exclusion (fixed morning-shift nurses and those who had passed the medication administration management course in past 6 months) criteria, 80 nurses were selected. Then they were randomly classified into two 40-member groups (control and intervention).

Data collection was done by researcher-made questionnaires and checklists. The questionnaire included two sections. The first section was about demographic data and the second one involved 21 four-option questions about the research goals, which evaluated the nurses' knowledge on nutrient-medication administration. The checklist included 17 items assessing the nurses performance in terms of nutrient-medication administration.

Their reliability was determined by content validation method.

For pretesting, the checklist was completed by the researcher in different shifts and then the questionnaires were filled up by the nurses in both groups. Then, for small group training, the intervention group was divided into four 10-member groups and the training was conducted by 4 sessions for each group (overall, 16 sessions were held). The sessions were 1 to 1.5 h long. During the sessions, the researcher taught and presented his opinions and played the role of leader in the sessions. He tried to guide the discussion in relevance to the topic. The nurses listen and thought, they also expressed their own thoughts and opinions. At the end, the discussions were summarized. During these sessions, different medication forms, medication preparation for gavage and washing of feeding tubes, common medication-medication/ medication-nutrient interactions were taught. One month after the intervention, the checklists and questionnaires were filled up by the researcher and nurses, respectively.

80 nurses of ICU participated in this study in two groups (intervention and control). The oldest and youngest participants had 48 and 23 years old, respectively. The average age of the participants was 32.23 with standard deviation of 4.26. Table 1 lists the demographic information of the participants.

Findings showed that before training, the knowledge of the nurses on the nutrient-medication administration by feeding tubes was weak in control (90.6%) and intervention (80%) groups. After the intervention, the knowledge status of the nurses in the intervention group improved and 97.1% of them had good knowledge on the topic (table 2). Before intervention, most of the nurses in both groups did not show proper performance in nutrient-medication administration. In a way that before training, there was no statistically significant difference between the two groups. But after the training, the nurses' performance improved in the intervention group and there was a significant difference between the two groups ($p < 0.05$) (table 3).

Findings

Table 1. demographic information

Variables		intervention		Control	
		number	%	Number	%
Education level	BSc	33	94.3	31	96.9
	MSc	2	6.7	1	3.1
gender	Female	35	100	32	100
	Male	0	0	0	0
university	Public	11	32.4	10	32.3
	Private	23	67.6	21	67.7
Organizational dependence	permanent	3	8.6	1	3.1
	Temporary-to-permanent	16	54.7	7	21.9
	Contract	16	45.7	17	53.1
	Resident	0	0	7	21.9
		mean±SD		mean±SD	
age		33.58±4.28		30.74±4.64	
experience		10.15±3.28		6.89±4.14	
GPA		16.08±1.34		16.06±1.34	

Table 2. Nurses knowledge state before and after training

Nurses knowledge	intervention		control	
	before	after	before	After
Weak	80	0	90.6	28.1
average	20	2.9	9.4	71.9
good	0	97.1	0	0

Table 3. mean score of the nurses before and after intervention

Performance mean score of the nurses	intervention		control		Mann–Whitney test				
	mean± SD	SD error	mean± SD	SD error	intervention		control		P-value
					Rank mean	Sum of ranks	Rank mean	Sum of ranks	
Before	2.51±0.56	0.09	2.37±0.49	0.08	35.94	1258	31.88	1020	0.32
after	10.45±1.24	0.21	2.53±0.56	0.1	50	1750	16.5	528	0.000***

** P<0.05, 0.001

DISCUSSION

This study first addressed the primary research goal “determination of the nurses’ knowledge on nutrient-medication administration by endoscopic gastric feeding tube before and after small group training among two groups (intervention and control)”. For this purpose, the nurses’ knowledge on medication forms, medication preparation and administration and common nutrient-medication interactions was assessed by means of questionnaires. It was observed that before intervention, the knowledge of the nurses was weak (90.6% in control and 80.5 in intervention group). After the intervention, the knowledge status of the nurses in intervention group improved and 97.1% of them had good knowledge on the topic.

In the present study, for analysis of the second goal (investigation of the nurses’ performance in terms of nutrient-medication administration by endoscopic gastric feeding tube for ICU patients before and after small group training), the nurses’ performance was evaluated by a checklist. The results revealed improper performance of all the nurses in this term. Before intervention, 100% of the nurses of control and intervention groups administered the medication of the patients in combination with their food by means of a gavage, before intervention, 00% of the control group and 80% of the intervention group did not employ the earth gravity for gavage, these conditions improved by training. In a way that 82.9% of the nurses in intervention group used gavage for medication without combining them with the food.

Studies have shown that inadequate knowledge and improper performance of the nurses in this regard. Study of Dashti et al revealed that 50% of the nurses did not have sufficient knowledge on medication forms and medication administration by feeding tubes. Pharmacist presented an educational program including courses and manuals for the intervention group nurses. Educational program enhanced the knowledge of the nurses about the nutrient and medication administration and nutrient-medication interactions. In the intervention group, before training, 17.6% of the nurses washed

the tube. This percentage reached to 59.37% after training (Dashti-Khavidaki S et al., 2012).Bemt et al conducted a multidisciplinary study to reduce the errors in medication administration by feeding tubes, this program included daily visit by the drugstore technician, putting the label of “Do not crush” on the drugs, establishment of a database on different forms of oral dosages, and accurate training of the nurses during their work. After the program, a significant decrease was observed in feeding tube blockage and errors of medication administration by the nurses. The main limitation of this study was lacking a control group (Bemt PMLAvd et al., 2006).

Regarding the mentioned reasons, the nurses’ errors could not be reduced only by training, as this study reported any changes in some items of checklist before and after the intervention. Application of alternative medication forms instead of solid tablets or using other routes for medication administration are some of these unchanged items. The responsibility for these items is not by the nurses and the physician is responsible. According to the studies, no proper professional relationship exists between the nurses and physicians. However, proper interaction of nurses and physicians can enhance the patient safety and improve the patient care quality. That’s why in spite of nurse knowledge about this field, the knowledge and skill exchange between the two groups are avoided due to improper nurse-physician interaction (Masror D et al., 2012; Shokri A et al., 2013; Azimi Lolaty et al., 2011). Also, the effective role of pharmacist in helping the physicians in drug prescription, nurses’ training and continuous monitoring of medication administration should not be neglected. Regarding the resources in this field, close collaboration of the therapy team including the physician, pharmacist and nurses, can enhance the drug administration by feeding tubes and prevention from their blockage, reduction of the errors in this regard and therefore increase of patients’ safety and decrease of hospitalization duration and costs.

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