

Original Article

The effect of interactive workshop on the quality of intra-hospital patients' transfer: A quasi-experimental study

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ABSTRACT

Background & Aim: Transferring critically ill patients from intensive care units to other wards is inevitable and may be associated with risks and complications for the patient. Therefore, the aim of this study was to examine the effect of training nurses through an interactive workshop on the quality of intra-hospital transfer of hospitalized patients in intensive care units.

Methods & Materials: In this quasi-experimental study, at first, the quality of intra-hospital transfer of patients from intensive care units were observed and assessed. Then, all the nurses working at these units participated in an interactive workshop. One month after the intervention, the quality of patients' intra-hospital transfer was re-evaluated by a checklist. Finally, the collected data was analyzed using SPSS software version 16.

Results: Results of this study showed that the quality of most of the intra-hospital transfers was undesirable (66%) and none of the transfers was performed in a desirable level, while, 52% of them had desirable quality after the intervention. The mean score of the quality of patient transfer was significantly increased from 47.49 ± 9.55 at the pre-intervention phase to 67.47 ± 12.80 at the post-intervention phase ($P < 0.001$).

Conclusions: According to the results, training nurses about the standards of intra-hospital patient transfer can improve the quality of intra-hospital transfer of critically ill patients that has not just become acceptable now and need to be improved. Therefore, to promote safe transfer of critically ill patients, it is recommended that nurses must undergo in-service training, especially as this subject does not exist in the formal nursing curriculum.

Introduction

Patient's safety is a basic concept in health systems and is one of the key elements of quality in the organizations (1). By maintaining patient's safety, treatment outcomes and the likelihood of success will increase (2). According to the World Health Organization (WHO), patient's safety is avoiding mistakes and preventing harmful effects on patients (3). Whereas, maintaining the safety and providing high quality care

for patients are two of the most important problems in intensive care units. Patients' safety in these units is at risk because of the patients' condition and the need for complex nursing care, and there is a risk of adverse events that can linger patients' hospitalization period (4). The characteristics of the work environment in intensive care units can threaten patients' safety and quality of care provided by the nurses (5). For example, factors such as high workload, fatigue, complexity of work, loud noises, inadequate equipment and also the need to transfer patients can affect the

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quality of care and patient's safety in intensive care units (6).

Most of the patients that require hospitalization in intensive care units are critically ill and have a complex situation, usually life-threatening (7). During the first 24 hours after admission to the intensive care unit, most of these patients will need to be transferred to relevant diagnostic units, while, the smallest transfer may make their status more complex and lead to dangerous and fatal consequences for the patients (8). However, one of the primary responsibilities of critical care nurses is to protect critically ill patients through continuous monitoring and immediate intervention in the case of injuries and accidents (9).

Some of the risks involved in patient transfer include: cardiovascular and respiratory compromises, insufficient administration of medication, poor monitoring, and multiple mechanical problems (10). Accidental events and untimely disconnection of medical equipment such as intubation, central venous or arterial catheters, urinary catheter, or nasogastric tube may lead to severe damages, injury or even death (11). These reports are related to the prevalence of transfer-related accidents in different hospitals; as the statistics show 2.5%-75% of patients are affected by transfer-related accidents (12). According to other studies, 66% of patient transfers are accompanied with harmful complications (13) and 32% of the patients experienced hypotension, hypoxia, hyperpnoea and tachypnea during transferring to other units (14).

As it was explained before, protecting patients during transfer to prevent such accidents and complications is one of the responsibilities of the healthcare team including nurses (15). The nurses' role in intra-hospital transfer of patients is crucially important. Existing guidelines recommend that, presence of two persons is required for

the transfer of critically ill patients. One of these two persons must be a qualified nurse with advanced cardiopulmonary resuscitation (CPR) certificate and experience of working in emergency situations (16, 17). Assessment of the patient, stabilization of patient's clinical condition, preparing the patient prior to the transfer, continuous monitoring of patient's condition during the transfer, and maintaining patient's safety and his/her dignity and privacy are some of the important responsibilities of nurses during patient transfer (18).

While transferring patients from the intensive care units, the nurse in charge of patient's care should accompany the patient during the transfer, as she/he knows the needs of the patient, is aware of his/her clinical status, and is familiar with patient's continuous monitoring and treatment goals. The nurse must also have sufficient knowledge about the standards of transferring patients in the hospital and has been trained for this task (19). Some of the causes of adverse events during patient transfer include incorrect clinical judgment and identification of problems, being in hurry, lack of attention, failure of protocols, and lack of proper preparation of equipment or patient. One of the reasons for these problems is lack of staff's knowledge about the principles of patient transfer and this gap can influence on the quality of nurses' performance in this matter (20). Stevenson et al. have shown that the level of knowledge of nurses and quality of transfer processes are undesirable, and often, both the physicians and nurses are not trained for this task or their training has not been sufficient (21). This issue highlights the importance of training nurses about the standards of safe patient transfer, especially since the nursing education curriculum in Iran does not pay enough attention to the standards of safe patient transfer, and

clinical nurses have too limited knowledge in this regard which affect their performance. One study with the purpose to evaluate the quality of patients transfer was conducted in Kashan and showed that the quality of 90% of intra-hospital patient transfers was not satisfactory (22). Also, another Iranian study that was conducted on neonates' transfer had similar results (23).

According to these evidences and since continuous education and improving knowledge of the staff involved in patient transfer must be considered carefully to prevent and minimize adverse events and improve patients' safety (20); this study was conducted to evaluate the effect of training nurses through an interactive workshop on the quality of intra-hospital transfer of hospitalized patients in intensive care units.

Methods

This study was a quasi-experimental study with before-after design that was conducted in the ICUs of one of the affiliated hospitals to Tehran University of Medical Sciences. The studied phenomenon in the present study was events of intra-hospital transfers of patients hospitalized in intensive care units. The inclusion criteria were intra-hospital transfer of patients to diagnostic units and transfer of the patient by critical care nurses. The exclusion criteria were inter-hospital transfer of the patient, transfer of the patient to other wards, and transfer of the patient by physicians, interns or assistant nurses. The sample size for events of intra-hospital transfers was calculated with this assumption that the intervention can minimally improve the quality of transfers about 30% ($P_0=50\%$; $P_1=80\%$). With a confidence interval of 95% and power of 80%, 50 events of transfers were calculated as the final sample size.

Data collection tools included three parts: 1) a form for recording characteristics of

nurses involved in the patient transfer, 2) a form for recording details about the events of intra-hospital transfers and 3) an observational checklist for evaluating the quality of intra-hospital transfer of patients. This checklist had 27 yes-no questions for evaluating the quality of intra-hospital transfer of patients in three phases: before, during and after the patient transfer. It was designed according to some guidelines (24, 25). Its validity was confirmed using content validity and experts' opinions who were consisted of 15 critical care faculty members, anesthesiologists and emergency/intensive care specialists (CVI=0.8). Its reliability was also confirmed by internal consistency using Kuder-Richardson (KR-21) ($\alpha=0.79$). In the observational checklist, observing the right performance (Yes) was scored as 1 and wrong performance (No) was scored as 0. Thus, the maximum and minimum scores of the checklist were 27 and 0, which were calculated on the basis of 100 for statistical analysis; higher scores indicated more compliance with the standards of patient transfer.

After receiving ethical approve from the Ethics Committee of Tehran University of Medical Sciences (93/d/130/834) and obtaining written informed consent from nurses, the quality of intra-hospital transfer of patients was studied in 50 transferring processes using the observational checklist. Then, guidelines and necessary skills of safe intra-hospital transfer of critically ill patients were taught to all the nurses (22 nurses) who worked in ICUs during two days of an interactive workshop. The educational content was based on the guidelines of safe patient transfer (24-27) and was taught in a way that nurses participated in teaching discussions and clinical scenarios, actively. In addition to the workshop, a booklet about safe patient transferring was also given to all the nurses for reading. The validity of the

educational content that included the standards of safe intra-hospital transfer of patients before, during and after the transfer was approved by anesthetists, intensive care specialists and critical care faculty members. One month after conducting the workshop, data about the quality of another 50 patient transfers were evaluated through direct observation by the same researcher and same checklist that was used before the

intervention. The total number of observed events of transfers was 100 which included 50 pre-intervention transfers and 50 post-intervention transfers. The study was completed during four months. Finally, data were analyzed using SPSS software (version 16; SPSS Inc., Chicago, IL, USA). Chi-square test, Fischer's exact test, and independent T test were used for analyzing the data.

Table 1. Characteristics of nurses involved in patient transfer

| Nurses' characteristics | | Before the intervention | | After the intervention | | Analysis |
|---|-----------------|-------------------------|------|------------------------|------|----------|
| | | N | % | N | % | |
| Gender | Male | 20 | 90.9 | 18 | 81.9 | 0.12 |
| | Female | 2 | 9.1 | 4 | 18.1 | |
| Age (years) | 25-30 | 18 | 81.8 | 20 | 90.9 | 0.06 |
| | 30-35 | 4 | 18.2 | 2 | 9.1 | |
| | Mean ±SD | 2.78±27.73 | | 1.90±27.80 | | |
| Marital Status | Single | 9 | 40.9 | 10 | 45.5 | 0.94 |
| | Married | 13 | 59.1 | 14 | 63.6 | |
| | < 3 | 5 | 22.7 | 5 | 22.7 | |
| Work experience as a nurse (years) | 3-6 | 9 | 40.9 | 10 | 45.5 | 0.44 |
| | >6 | 8 | 36.4 | 7 | 31.8 | |
| | Mean ±SD | 2.49±5.2 | | 1.87±5.50 | | |
| Work experience in ICUs (years) | < 3 | 9 | 9.4 | 6 | 27.2 | 0.97 |
| | 3-6 | 6 | 27.3 | 8 | 36.4 | |
| | >6 | 7 | 31.8 | 8 | 36.4 | |
| | Mean ±SD | 2.28±4.43 | | 2.09±5.10 | | |
| Total | | 22 | 100 | 22 | 100 | |

Table 2. Characteristics of ICU patients who were transferred before and after the intervention

| Transferred patients' characteristics | | Before the intervention | | After the intervention | | Analysis |
|---|-------------------------|-------------------------|-----|------------------------|-----|----------|
| | | N | % | N | % | |
| Gender | Male | 27 | 54 | 23 | 46 | 0.5 |
| | Female | 23 | 46 | 27 | 54 | |
| | ≤29 | 6 | 12 | 3 | 6 | |
| Age (year) | 30-44 | 12 | 24 | 6 | 12 | 0.3 |
| | 45-59 | 12 | 24 | 13 | 26 | |
| | 60-74 | 11 | 22 | 16 | 32 | |
| | ≥75 | 9 | 18 | 12 | 24 | |
| Cause of hospitalization in ICU | Cardiovascular diseases | 12 | 24 | 18 | 36 | 0.1 |
| | Respiratory diseases | 6 | 12 | 6 | 12 | |
| | Neurology diseases | 10 | 20 | 14 | 28 | |
| | Renal diseases | 0 | 0 | 0 | 0 | |
| | Infection | 8 | 16 | 5 | 10 | |
| Mobility status of patient in ICU | Others | 14 | 28 | 7 | 14 | 0.2 |
| | CBR | 29 | 58 | 25 | 50 | |
| | RBR | 21 | 42 | 25 | 50 | |
| Level of patient's consciousness * | ≤8 | 7 | 14 | 6 | 12 | 0.9 |
| | 9-12 | 17 | 34 | 19 | 38 | |
| | 13-15 | 26 | 52 | 25 | 50 | |
| Means of transportation | Stretcher | 38 | 76 | 40 | 80 | 0.7 |
| | Wheelchair | 12 | 24 | 10 | 20 | |
| Total | | 50 | 100 | 50 | 100 | |

*Based on Glasgow Coma Scale

Results

Characteristics of the nurses participating in the study and ICU patients who were transferred are shown in tables 1 and 2. Statistical analysis showed that, the data, before and after the intervention, was homogenous in terms of all the variables that are mentioned.

The findings of the pre-intervention phase showed that, the quality of majority of intra-hospital transfers were undesirable (66%)

and none of the transfers was performed at a desirable level, while, 52% of the transfers after the intervention had desirable quality (table 3). Based on the results of t-test, the mean score of the quality of nurses' performance in relation to safe intra-hospital patient transfer was significantly increased after performing the interactive workshop (67.47 ± 12.80) compared to before the intervention (47.49 ± 9.55) ($P > 0.001$).

Table 3. The quality of intra-hospital transfer of ICU patients before and after training the nurses

| Transfer Quality | Before the intervention | | After the intervention | |
|---------------------------------------|---------------------------------------|-----|------------------------|-----|
| | N | % | N | % |
| Undesirable (score <50%) | 33 | 66 | 4 | 8 |
| Relatively Undesirable (score 51-75%) | 17 | 34 | 20 | 40 |
| Desirable (score >75%) | 0 | 0 | 26 | 52 |
| Total | 50 | 100 | 50 | 100 |
| Mean \pm SD | 47.49 \pm 9.55 | | 67.47 \pm 12.8 | |
| Test result | T test =8.84; df=98 P-value <0.001 | | | |

Discussion

Since intra-hospital transfer of critical patients is associated with many complications, preventing them is a priority and nurses have numerous important roles in addressing them. The results of this study showed that, the quality of intra-hospital transfers of critical patients was poor in more than half of the cases (66%). Other studies in Iran also showed the same results as the majority of all the intra-hospital transfers in those studies had unacceptable quality and could put patients' safety at risk (22,28). The results of another study that was conducted in 2012, Tehran, showed that the majority of the intra-hospital neonates' transfers had been done with dissatisfied quality. According to the results; 56.6% of the transfers were done without monitoring the level of blood oxygen and necessary equipment and drugs were not enough during transferring the newborns in 71.8% of the cases (23). Considering the fact that,

inter-hospital and intra-hospital transfers of patients are not discussed in any of the nursing education's courses in Iran, and also, lack of nurses' knowledge about the relevant standards, these findings are justifiable. Thus, the need for some interventions including nursing education is becoming more and more evident .

The results showed that, after conducting the interactive workshop, the quality of patient transfer was improved dramatically as, only 8% of the transfers were undesirable and the rest were at high and moderate standard levels. These findings showed that, interactive education was able to affect nurses' performance in a way that, one month after the training; nurses were still trying to use the standards of patient transfer. The mean of differences in the scores of quality of the transfers before and after the intervention was statistically significant. Stevenson et al. (2005), in their study reached similar results and stated that, training could significantly improve the

safety of critically ill patients' transfer, and increased knowledge of nurses can cover the deficits of their performances (21). As shown in another study, nurses who had been trained about newborns' transfer had more qualified performance in comparison to neonatal residents that were not trained about the subject (29). Berube et al. in 2013 examined the effect of a prevention program on accidents during critically ill patients' transfer and found 20% reduction in related complications. They reported the improved knowledge of the healthcare providers about patient transfer as one of the reasons for this reduction (30). In another study that was conducted to reduce unexpected accidents during intra-hospital transfer of patients in the emergency department, it was revealed that training nurses and applying a performance checklist will reduce the accidents related to patient transfer from 36.8% to 22.1% (31). The result of another research in Iran, about using a performance checklist for improving the quality of patient transfer was also similar (28).

In general, considering the results of this study, it was determined that the quality of intra-hospital transfers of critically ill patients by nurses is undesirable and dissatisfied and they are not complied with the standards of patient transfer. As well, it was revealed that, interactive education can influence on the quality of nurses' performance in this issue. Therefore, it is recommended that, in order to improve the quality of intra-hospital transfers and enhance patients' safety, the standards and guidelines of patient transfer should be included in the official curriculum of nursing education; so that nursing students can gain the necessary knowledge in this regard. As well, it is recommended that the managers will try to improve the knowledge and performance of staff nurses about safe patient transfer, both intra and inter-hospital transfers, through developing some

educational programs, especially in interactive ways .

One of the strengths of this study was using interactive method for conducting the education and using clinical scenarios as issues for interactive discussion during the workshop. Maybe, using that educational strategy was the reason for lingered maintenance of the intervention's outcomes. The use of direct observation method to assess the quality of nurses' performance in patient transfer was another strength of this study, however, it could also be considered as a limitation, as it could have affected the behavior of nurses. Thus, to control it, the researchers tried to have continuous presence in the study environment long before gathering the data, in order to normalize their presence for nurses and reduce its influence on them. This study was conducted with before-after one-group design and it was in exposure to maturation as an internal threat. Therefore, it is reasonable to provide more powerful evidences through other studies with control groups .

Since there is no information about inter-hospital patient transfers, and as nurses' role and duties are not been specifically defined in that regard, the authors would recommend further studies to be conducted on this subject.

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Conflict of Interest

None reported.

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