

A Descriptive Study to Assess Factors influencing Intra-hospital Transfer of Critically Ill Patients in Selected Hospital in the City

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Abstract: The study was aimed at assessing the factors influencing intrahospital transfer of critically ill. **Methods:** Exploratory descriptive research design was used in the study. 70 intrahospital transport events were included in the study with non probability convenience sampling at critical care unit of tertiary care hospital. Data related to factors influencing intrahospital transfer of critically ill patient was collected with checklist critically ill patients visiting for their hemodialysis. **Results:** Assessment of factors influencing intrahospital transfer of critically ill patients which include patient related factors, staff related factors and environment related factors revealed that in Patient related factors, majority 44(62.9%) cases had adequate ventilation, whereas 26(37.1%) cases had inadequate ventilation. In staff related factors, 40(57.1%) of cases were highly efficient whereas 30 (42.9%) are poorly efficient. In environment related factors, transport was effective in 38(54.3%) cases whereas it was ineffective in 32(45.7%) cases. **Conclusion:** Transporting critically ill patients requires the assessment of the different patient, staff and environment related factors which can have deleterious effect on patient. Despite improvement in the intrahospital transport practices, significant risks are still involved in such procedure.

Keywords: Intrahospital transfer, critically ill patients

1. Introduction

The safest place for the critically ill patient is intensive care unit (ICU), connected to a sophisticated ventilator with all infusion pumps running smoothly, complete monitoring installed, and with a nurse present to care for the patient. Unless there are nursing, diagnostic or therapeutic procedures going on, the patient is in a more or less calm and controlled environment. In the case of an emergency, a team of well-trained nurses and physicians is available with all the necessary equipment at hand.¹ Technological advances led to considerable improvement in intensive care medicine in terms of treatment aspect as well as diagnostic techniques. Today ICU is considered the safest place with the highest level of monitoring of critically ill patients.² Despite all the sophistication observed in ICUs, not all exams or care required by these patients can be offered at the bedside, and patients frequently need to be transported within the hospital.³ There may be situations when the patient has to leave this secure surroundings to be transported to the radiology department, operating room or some other hospital. This transport may create an increased risk for mishaps and adverse effects by disconnecting such critically ill patients from equipment, shifting them to stretcher and reducing the person and equipment around.¹ Intrahospital transport is the temporary or permanent forwarding of critical patients within the hospital environment, whether with diagnostic or therapeutic purposes. Critically ill patients may have absent or small physiological reserves. Adverse physiological changes in these patients during intrahospital transport are common and can be life threatening. Ventilator dependent and hemodynamically unstable patient are at particular risk. Careful planning is required to move these patients between hospital facilities such as operating theatres, ICU, Emergency Department and imaging rooms. Such intrahospital transport is usually elective, but a need for urgency must also be anticipated. Intrahospital transfer is a

time of potential complications because the patient is out of the intensive care environment. Unfortunately, these transports carry risks that are manifested as unexpected events (UEs), often referred to as adverse events, complications, insults, or mishaps. Examples include acute change in vital signs, mental status, ineffective sedation, cardiopulmonary arrest, and death.⁴

2. Literature Survey

A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research.

Hyun Ju Min, et al. (2019) conducted a retrospective cohort study on 'Intra-hospital transport of critically ill patients with rapid response team and risk factors for cardiopulmonary arrest' in a 1300-bed tertiary-care teaching hospital to determine the occurrence rate and risk factors of cardiopulmonary arrest (CPA) during intra-hospital transport (IHT) among critically ill patients, accompanied by a rapid response team (RRT). He stated that four components of intra-hospital transport (IHT) were essential for safe patient transport: "pre-transport coordination, accompanying personnel, equipment, and monitoring during transport". Ideally, these guidelines recommend that all critical care transports be performed by specially trained individuals, as qualified personnel in critical care can adequately cope with at-risk patients and intervene in the event of serious adverse events (AEs), such as hypoxia, hypotension, etc. as well as minor AEs.⁵

Julia C. Tolentino, et al. (2018) in the article 'Adverse Events during Intrahospital Transfers: Focus on Patient Safety' stated the unique aspect of it which includes sections dedicated to risk assessment, commonly seen patterns of transfers and complications, as well as the inclusion of

family. communication as a core component of the process. The overall goal of providers and patient safety champions should be the achievement of “zero incidence” rate of IHT-related events. Although the overall risk profile of IHTs depends on patient acuity, other factors are important risk determinants as well, including location and distance between hospital departments, team member knowledge and communication, the complexity of medical management, and the equipment involved. Significant amount of provider/staff training is required to optimize the team performance and minimize the overall risk of an adverse event occurring during an IHT. Healthcare professionals are encouraged to strictly follow the fundamentals of patient safety, as outlined throughout the *Vignettes in Patient Safety* cycle, to help reduce complications and to propagate a culture of safety throughout their clinics and hospitals.⁶

Lina Bergman, et al. (2018) conducted a critical incident study on ‘Improving quality and safety during intrahospital transport of critically ill patients’ to explore critical care nurses, and physician’s experiences and practices associated with critical incidents during the transfer process in critically ill patients. Exploring the experiences of nurses and physicians in transporting critically ill patients yielded three main themes. The first theme, a hazardous process, revealed how caring for critically ill patients during intrahospital transfers was perceived as an unsafe, demanding task that presents several threats to the patient's safety. However, despite worries and concerns, participants trusted their own abilities to handle unexpected events resulting in the second theme, performing when it matters. The third theme, towards safe practice, captured suggestions for improvement and attitudes towards existing safety hazards. To prevent and manage critical incidents during intrahospital transport, findings of this study suggest that nontechnical skills such as situational awareness and teamwork are essential. In addition, the team must possess the requisite technical skills and knowledge to undertake transports.⁷

Francielli Mary Pereira Gimenez, et al (2017) conducted a Prospective cohort study on ‘Analysis of Adverse Events during Intrahospital Transportation of Critically Ill Patients’ to describe adverse events occurring during intrahospital transportation of adult patients hospitalized in an Intensive Care Unit (ICU) and to evaluate the association with morbidity and mortality. A total of 293 patients were analyzed with follow-up of 143 patient transportation's and records of 86 adverse events. Of these events, 44.1% were related to physiological alterations, 23.5% due to equipment failure, 19.7% due to team failure, and 12.7% due to delays. Half of the events were classified as moderate. The mean time of hospital stay of the group with adverse events was higher compared to patients without adverse events. Physiological alterations were the most frequently encountered events, followed by equipment and team failures. The degree of damage associated with adverse events was classified as moderate and associated with an increase in the length of hospital stay.⁸

3. Problem Definition

“Descriptive Study To Assess Factors Influencing Intrahospital Transfer Of Critically Ill Patients.”

4. Objectives of the study

4.1 Primary Objectives

- To assess patient related factors influencing intrahospital transfer of critically ill patients.
- To assess staff related factors influencing intrahospital transfer of critically ill patients.
- To assess environment related factors influencing intrahospital transfer of critically ill patients.
- To assess adverse events during intrahospital transfer of critically ill patients.

4.2 Secondary Objective

To identify association of factors influencing intrahospital transfer of critically ill patient with adverse events.

5. Methods/ Approach

The research approach is a plan and procedure that consists of the steps of broad assumptions to detailed methods of data collection, analysis, and interpretation. It is, therefore, based on the nature of the research problem being addressed.⁹

The present study used cross sectional descriptive design to assess the to assess factors influencing intrahospital transfer of critically ill patients. Sampling is a technique of selecting individual members or a subset of the population to make statistical inferences from them and estimate characteristics of the whole population.¹⁰ Intrahospital transfer of critically ill patient were included in the study with non probability convenient sampling. Inclusion criteria & exclusion criteria was as follows

Inclusive criteria: Critically ill adult patient, transporting within the hospital to either diagnostic studies or therapeutic procedures.

Exclusive criteria: Intrahospital transport involving patient being transported to wards from critical care unit were not included in this study.

Instrument: There were two sections made for data collection.

Section I: Observation Checklist

Checklist consist 36 items regarding assessment of different factors influencing intrahospital transfer of critically ill patient.

Section II: Observation Checklist; It consisted of 10 items regarding assessment of adverse events.

6. Results

Data analysis was planned using the SPSS (Statistical Package for the Social Science) version 17 for window. The patients related factors, staff related factors, environment related factors, adverse events were planned to calculated with no and percentage. Application of proportion test was planned for statistical analysis to find significant association

of patient, staff, and environment related factors with adverse events. A probability value of 0.05 was accepted as the level of statistical significance. The level of statistical significance for this study was set at 95%

Section I: Analysis of data related to assessment of the Patient related factors influencing intra hospital transfer of critically ill patients.

Section II: Analysis of data related to assessment of the Staff related factors influencing intra hospital transfer of critically ill patients.

Section III: Analysis of data related to assessment of the Environment related factors influencing intra hospital transfer of critically ill patients.

Section IV: Analysis of data related to assessment of the adverse events during intra hospital transfer of critically ill patients.

Section V: Association between patients, staff and environment related factors with adverse events.

Section I

Table 1: Assessment of the patient related factors influencing intra hospital transfer of critically ill patients.

Patients related factors		No of cases	Percentage
Ventilation Status	Adequate	44	62.9
	In adequate	26	37.1
Status of invasive line	Secured and patent	37	52.9
	Not secured and not patent	33	47.1
Hemodynamic stability	Stable	46	65.7
	Unstable	24	34.3
Level of Consciousness	Conscious	49	70
	Altered consciousness	21	30

n=70

Table.1 shows that majority 44(62.9%) cases had adequate ventilation, whereas 26(37.1%) cases had inadequate ventilation. Out of 70 cases, status of invasive lines of 37(52.9%) cases were secured and patent and 33(47.1%) were not secured and not patent. 46 (65.7%) were hemodynamically stable and 24(34.3%) were hemodynamically unstable. 49 (70%) cases were conscious and 21(30%) cases with altered consciousness.

Section II

Table 2: Assessment of the staff related factors influencing intra hospital transfer of critically ill patients, n=70

Staff related factors		No of cases	Percentage
Efficiency of transport team	Highly efficient	40	57.1
	Poorly efficient	30	42.9
Patient –nurse ratio affecting workload of transport team	Maintained	21	30
	High workload	49	70

Communication	Effective	53	75.7
	Poor	17	24.3

Table 2 shows, 40(57.1%) of cases were highly efficient whereas 30(42.9%) are poorly efficient. In patient – nurse ratio affecting workload of transport team, 21(30%) had maintained workload and 49 (70%) had high workload. In 53(75.7%) had effective communication and 17(24.3%) had poor communication.

Section III

Table 3: Assessment of the environment related factors influencing intra hospital transfer of critically ill patients, n=70

Environment related factors		No of cases	Percentage
Organization of Transport	Effective	38	54.3
	Ineffective	32	45.7
Equipment Availability	Adequate	53	75.7
	Inadequate	17	24.3
Equipment Functioning	Effective	7	10
	Poor	63	90

Table3. Shows organization of transport was effective in 38(54.3%) cases whereas it was ineffective in 32(45.7%) cases. In 53(75.7%) cases equipment's availability was adequate and in 17(24.3%) it was inadequate. Effective equipment functioning was in 7(10%) whereas it was poor in 63(90%) cases.

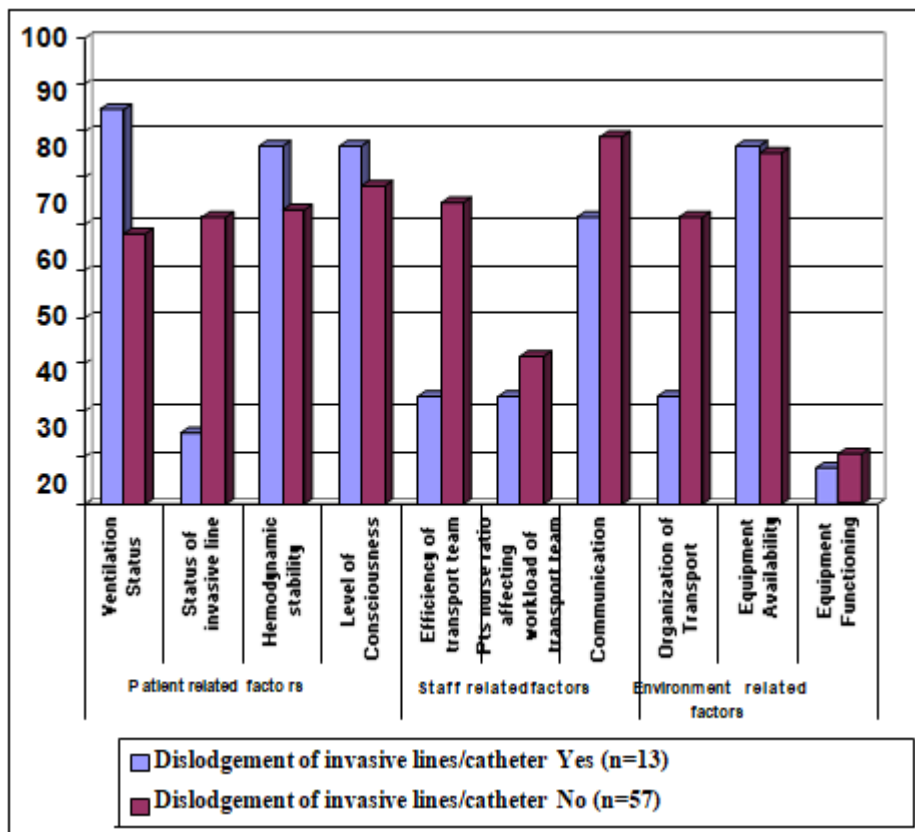
Section IV

Table 4: Assessment of the adverse events during intra hospital transfer of critically ill patients, n=70

Adverse events	No of cases	Percentage
O2 desaturation	36	51.4
Patient's agitation	34	48.6
Malfunctioning of equipment	14	20
Equipments power failure	14	20
Dislodgement of invasive lines/ catheter	13	18.6
Injury to patient	8	11.4
Oxygen exhaust	8	11.4
Intra Venous line or vasoactive drug infusion disconnection	4	5.7
Accidental extubation	3	4.3
Expulsion of invasive lines and drains	1	1.4

Table no.4 shows that during 70 intrahospital transports, observed adverse events are O2 desaturation occurred in most cases i.e.36(51.4%), Patient's agitation in 34(48.6%),whereas malfunctioning of equipment and equipment power failure occurred in 14(20%) cases.13(18.6%) cases found with dislodgement of invasive lines/catheter. 8(11.4%) cases had oxygen exhaust and injury to patient. Intravenous line and vasoactive drug infusion disconnection occurred in 4(5.7%) cases. Accidental extubation happened in 3 (4.3%) and only 1(1.4%) of cases had expulsion of IV lines and drains.

Section V



Bar diagram No.1 showing association of patient, staff and environment related factors with dislodgement of invasive lines/catheter

7. Discussion

Likewise, Ursula Beckmann, et al.(2004) conducted a study on Incidents relating to the intra-hospital transfer of critically ill patients . The result shows serious adverse outcomes occurred in 55 reports (31%) including major physiological derangement (15%), patient/relative dissatisfaction (7%), prolonged hospital stay (4%), physical/psychological injury (3%) and death (2%). Communication problems, inadequate protocols, inservicing/ training and equipment were prominent equipment-related incidents. Errors of problem recognition and judgement, failure to follow protocols, inadequate patient preparation, haste and inattention were common management-related incidents. Rechecking the patient and equipment, skilled assistance and prior experience were important factors limiting harm.

In Present study, the investigator also observed adverse events are O2 desaturation occurred in most cases i.e.36(51.4%),Patient's agitation in 34(48.6%),whereas malfunctioning of equipment and equipment power failure occurred in 14(20%) cases 13(18.6%) cases found with dislodgement of invasive lines/catheter. 8(11.4%) cases had oxygen exhaust and injury to patient. Intravenous line and vasoactive drug infusion disconnection occurred in 4(5.7%) cases. Accidental extubation happened in 3 (4.3%), only 1(1.4%) of cases had expulsion of IV lines and drains because invasive lines are secured inappropriately, tangled and dressed appropriately.

Dislodgement of invasive lines/catheter when the invasive lines were not secured and dressed properly it results into its

dislodgement because of sutures were removed out accidentally.

8. Conclusion

Transporting critically ill patients requires the assessment of the different patient, staff and environment related factors which can have deleterious effect on patient. Despite improvement in the intrahospital transport practices, significant risk are still involved in such procedure. Because of their critical health patients are vulnerable to have significant adverse event. At the same time the resources available to the patient may be more limited outside the ICU. Thus, steps should be taken to avoid deleterious effect of different factors which are affecting adversely on critically ill patient by providing same level of care, monitoring and interventions available in ICU. Adequate vital parameters for patient, efficient transport team and effective organization are the important factors to render the transport procedure safe. The widespread use of checklist, development of adapted equipment, and proper training programme would increase the safety of intrahospital transport and reduce the risks to patient in the long run.

9. Future Scope

Nursing education:

During clinical training to the nursing students, intrahospital transport of critically ill patient also should be incorporated and emphasized to ensure proper training for safe patient transport practices. Additionally, the seminar can also be organized to create awareness about standard practices to be

followed to carry out safe intrahospital transport. Thus ensuring safe transfer of patient.

Nursing practice:

The study emphasizes that in clinical settings, while transportation of critically ill patients, the staff nurses should be more focused on assessment of influence of factors which have adverse events on critically ill patient during intrahospital transportation to decrease their incidence and to have safe transport. Thus, staff nurses should make themselves aware of the hospital protocol to prevent adverse events. This will ultimately result in quality nursing care leading to enhanced care and safety of critically ill patient.

Nursing administration:

The nurse administrator can arrange in service education programme for transport team member such as physician, staff nurses and even multipurpose worker in collaboration with organization administrator to improve knowledge and practices regarding factors which influences on critically ill patient during intrahospital transfer. Similarly, he/she can include lectures regarding standard practices to be followed during intrahospital transportation of critically ill patient in orientation program for staff nurses working in critical care units.

Nursing research:

Nurse researcher can use the research findings to prevent adverse events of patients which occurs during intra hospital transfer of critically ill patient. She can conduct further research by focusing on demographic variables of critically ill patient which will help to reduce the number of adverse events and to plan effective transportation protocols.

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