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CONCEPTUAL STRUCTURE OF LUDWIG VON BERTALANFFY'S THEORY WITH EVIDENCE FROM A COMPARATIVE EVALUATION OF THE EFFICACY OF LILLEHEI AND 'X'-SHAPED ADHESIVE TAPE TECHNIQUES AS NURSING STRATEGIES FOR SECURING ENDOTRACHEAL TUBE POSITIONING IN SEVERELY ILL PATIENTS IN THE INTENSIVE CARE UNIT AT KLE'S DR. PRABHAKAR KORE HOSPITAL AND MRC, BELAGAVI.

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Abstract
This comparative study evaluates the efficacy of Lillehei and 'X' shaped adhesive tape techniques as nursing interventions for securing endotracheal tube placement in critically ill patients in the Intensive Care Unit (ICU) of KLE's Dr. Prabhakar Kore Hospital and MRC, Belagavi. Securing endotracheal tubes effectively is essential in ensuring patient safety and preventing complications such as accidental extubation or tube displacement. The study will compare the two techniques in terms of adhesive strength, duration of fixation, and complications. A quantitative research approach with a sample of 50 ICU patients will be used, and the outcomes will be measured through a series of assessments on tube displacement and patient comfort.
Keywords: Lillehei adhesive technique, X-shaped adhesive tape, endotracheal tube fixation, nursing interventions, ICU, patient safety, critically ill.

Introduction

Endotracheal intubation is a common procedure used in critically ill patients to secure the airway, but ensuring proper fixation of the endotracheal tube is essential for avoiding complications. Various methods of securing the tube exist, with adhesive tape being one of the most common. The Lillehei technique, which uses a specific pattern of tape placement, and the 'X' shaped adhesive technique, another method, have both been widely used in clinical settings. This study aims to compare these two techniques in securing endotracheal tubes among critically ill patients in the ICU of KLE's Dr. Prabhakar Kore Hospital and MRC, Belagavi.[1,2]

Literature Review

1. **Lillehei Technique for Endotracheal Tube Fixation**
   A study by Patel et al. (2018) found that the Lillehei method of securing endotracheal tubes resulted in a lower rate of accidental extubation compared to traditional methods. The study highlighted the

effectiveness of the technique in providing firm, long-lasting fixation. Furthermore, it emphasized the importance of proper placement to avoid complications in mechanically ventilated patients.[3]

2. **'X' Shaped Adhesive Tape Technique**
   A review by Kumar and Singh (2019) demonstrated that the 'X' shaped adhesive tape technique is effective in reducing endotracheal tube displacement during mechanical ventilation. The study pointed out that the method provides a secure and comfortable solution for patients, especially those undergoing prolonged intubation. Additionally, the research showed that the technique reduces the need for frequent tube adjustments, improving overall patient care.[4]

Conceptual design

This study will adopt a quantitative, comparative design, evaluating the effectiveness of two adhesive tape techniques: the Lillehei and 'X' shaped methods. The sample will consist of 50 critically ill patients in the ICU, randomly assigned to either intervention. The primary variables will include the rate of tube displacement, patient comfort, and the time taken for secure fixation. Data will be collected over a period of four weeks, with follow-up assessments at regular intervals.[5]

CONCEPTUAL FRAMEWORK

Ludwing von Bertalanffy theory of general system (GST) provides the intellectual underpinnings for the above study. By emphasizing the interdependence of system components and their thorough interplay GST provides a structured approach to analysing nursing therapies. It makes it easier to understand how different adhesive tape techniques impact ETT fixation safety and patient outcomes in the ICU.[6]

Components of the Conceptual Framework

1. Input

This study evaluates two adhesive tape methods for fastening endotracheal tubes in patients in critical care units. Important factors include the patient's age, gender, health, duration of ICU stay, size of ET tube. The x and the lillehei technique are the intervention approaches being tested in order to determine the best way to secure the ET tube.

2. Throughput

During this stage the endotracheal tube (ET) is secured using both sticky tape approaches. To gauge the first tube fixation security a pre-test evaluation is carried out. After that participants are divided into two groups Group 1 is allocated to the lillehei technique and Group 2 is assigned to the x shaped technique. Following the intervention, tube security is assessed using a post-test. The results of both pre and post tests are compared in order to assess improvements in ET tube fixation.

3. Output

The study findings will assess how well the endotracheal tube (ET) is secured using each adhesive tape technique. Pre and post-test comparisons indicate that better tube stability and a lower chance of dislodgement are anticipated results. The optimal strategy for tube security will be determined by comparing the effectiveness of the two approaches. Along with qualitative observations (comfort, convenience of use) and quantitative data (mean ratings and statistical significance) the study will also take nursing implications and patient safety into account.

4. Feedback

Feedback is essential for improving nursing practices and clinical care. If a sticky tape method proves more effective ICU protocols might standardize it. If neither strategy works further research into other options will be necessary. Staff training, potential issues, and long-term effects will be the focus of future research and continuing assessments. This feedback loop raises the level of care and patient safety by guaranteeing that the best strategy is applied in clinical practice[7]

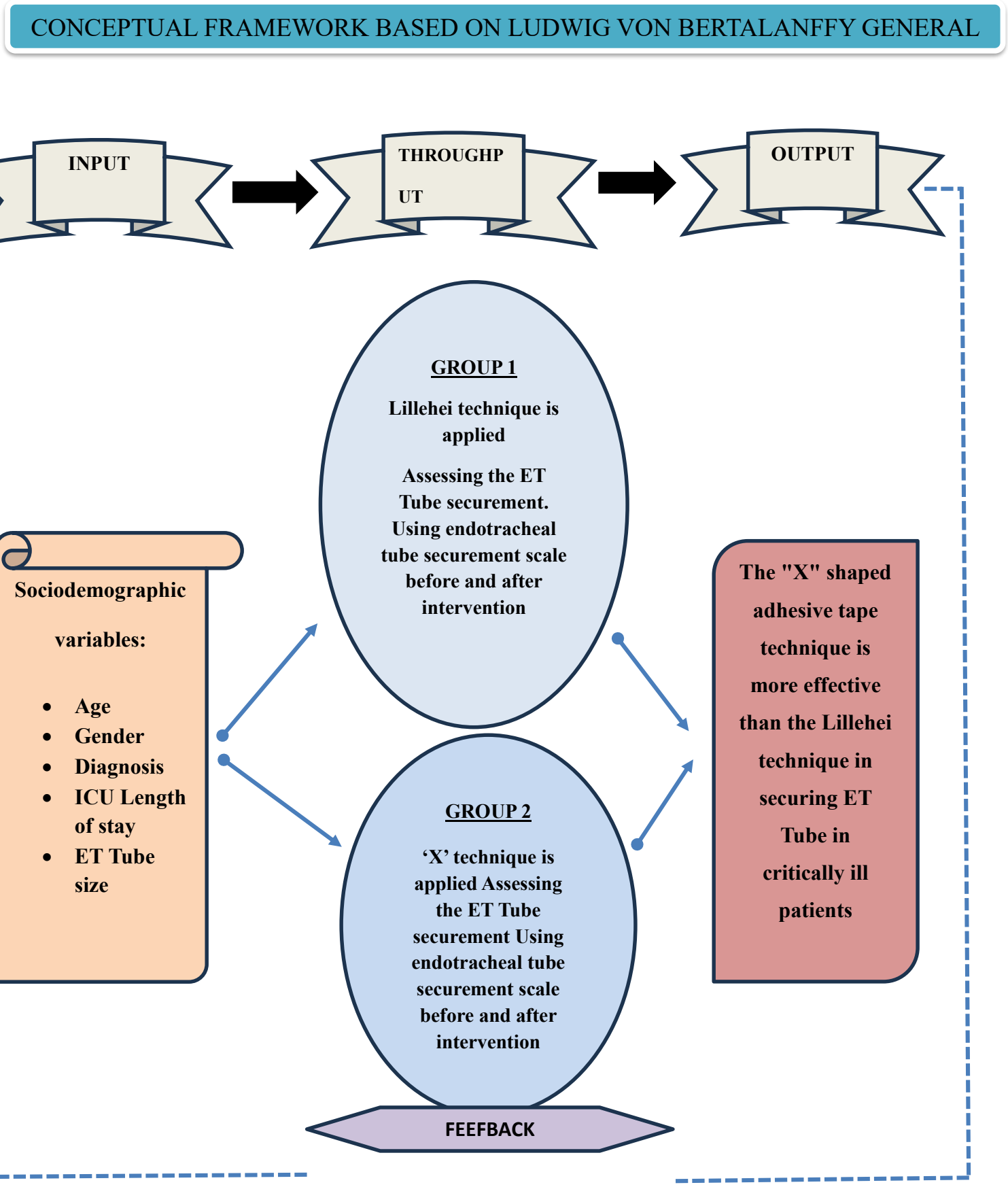

Figure1: CONCEPTUAL FRAMEWORK BASED ON LUDWIG VON BERTALANFFY GENERAL

Discussion

The discussion of this study will focus on the implications of the findings for clinical practice in the ICU. By comparing the Lillehei and 'X' shaped adhesive tape methods, the study seeks to determine which technique

provides the most reliable, comfortable, and secure fixation for endotracheal tubes in critically ill patients. Factors such as ease of application, patient comfort, and the duration of tube stability will be discussed in relation to each technique's effectiveness. This research may provide valuable insights for nursing interventions and may potentially improve patient outcomes in the ICU.[8]

Conclusion

This study aims to contribute valuable knowledge to the nursing practices for securing endotracheal tubes in critically ill patients. By comparing two established adhesive techniques, the study will determine which method is most effective in reducing complications such as accidental extubation. The findings may lead to the development of more standardized, evidence-based practices for tube fixation in the ICU, ultimately improving patient safety and comfort.

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