

Development of an Education Program for Registered Nurses Related to the Use and Function of Mechanical Prophylaxis in VTE Prevention

Mollie Garrison, BSN, RN

Cynthia Padula, PhD, RN



RHODE ISLAND COLLEGE

SCHOOL OF NURSING

Background/Problem Statement

- An estimated 550,000 adult hospitalizations during 2007-2009 had a discharge diagnosis of VTE and 70% of cases are believed to be preventable (Centers for Disease Control and Prevention, 2018).
- More than half of post-hospital diagnosis of VTE are associated with a recent hospitalization and surgical procedure and is the fifth leading cause of hospital readmissions (CDC).
- High Risk Patients include:
 - Patients undergoing a surgical procedure with a total anesthetic and surgical time of 90 minutes or more.
 - Patients undergoing surgery involving the pelvis or lower limbs with a surgical time of 60 minutes or more.
 - Acute surgical admission with inflammatory or intra-abdominal conditions.
 - Expected significant reduction in mobility
 - Or one or more of the following:



Methods

Purpose

The purpose of this project was to assess nurse understanding on the use and function of VTE prophylaxis, specifically mechanical prophylaxis.

Design

This program development project included a pretest, intervention, and posttest design. Based upon the findings of the pretest, an educational program was developed to educate nurses on the use and function of mechanical prophylaxis. A program evaluation form was provided to participants for feedback and to ensure the project met the stated learning objectives.

Sample and Sites

Nurses at Rhode Island Hospital, a Brown University affiliated teaching hospital, working on the surgical unit, COOP 3, and caring for the postsurgical and trauma patients were included in the study. There were 32 active registered nurses on the unit.

Activities and Program Development

Content included: general nursing knowledge of mechanical therapy; discussion of alternative SCD devices and contraindications to using devices; proper sizing; required patient care and education; nurse documentation of device usage; and parameters for appropriate discontinuation. A poster presentation was used to display the information and nurses received informational cards with key information, such as a sizing chart, frequent alarms and troubleshooting the devices.

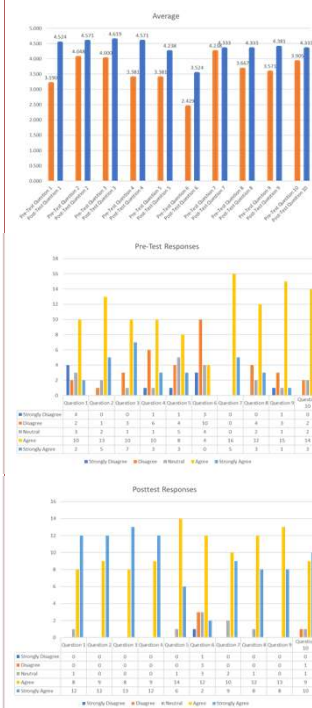
Summary & Conclusions

- A total of 21 nurses attended the educational sessions and completed a pre- and posttest for a 66% response rate.
- The response rate increased by 0.7 points overall in the posttest, demonstrating increased understanding on the use and function of mechanical prophylaxis in VTE prevention.
- Limitations included:
 - Program conducted during a hospital-wide Joint Commission survey resulting in two afternoon sessions being canceled.
 - Most nurses could not give 30-35 minutes of their time away from patient care. Sessions had to be condensed to meet nursing demands.
 - The number of leaves of absences could have affected participation rates.
 - The results of the education program reflect the experience of one unit and cannot reflect the current knowledge of all nurses within Rhode Island Hospital on this topic.
- At the completion of the educational sessions, nurses were more likely to agree that they had been formally trained on the use and function of mechanical prophylaxis, increased familiarity with foot pumps as a compression device, and defining appropriate usage of therapy including maintaining therapy while sitting in a chair.

Review of Key Literature

Study	Findings
MacDougal et al (2006) – examined annual healthcare costs related to VTE events	<ul style="list-style-type: none"> Annual healthcare costs to treat: <ul style="list-style-type: none"> DVT: \$7,227; PE: \$6,831; \$6,771; DVT & PE Outpatient pharmacy related costs to treat: <ul style="list-style-type: none"> DVT/PE subgroups: \$3,645; Control group: \$600
Ho & Tan (2013) – analyzed 40 trials that compared the effect of intermittent pneumatic compression (IPC) vs. no IPC	<ul style="list-style-type: none"> Total risk reduction of 9.4% of developing DVT with IPC Total risk reduction of 1.6% of developing PE with IPC
Brady et al (2007) – observed 137 patients ordered for mechanical prophylaxis for compliance	<ul style="list-style-type: none"> Only 29.2% (n=40) had them applied Only 26% (n=26) had them on correctly Common reasons for noncompliance stated by patients were just completing personal care, nurse failure to restart therapy/replace device upon unit transfer, and not being cognizant of inactive devices
Elder et al (2016) – explored causes for the variation in VTE pharmacological prophylaxis among nurses at Johns Hopkins Hospital	<ul style="list-style-type: none"> Using a mixed method approach, found that nurses used clinical judgement to determine when to omit pharmacological prophylaxis Nurses on their units for a lesser amount of time were more compliant with VTE prophylaxis
Kim and Lee (2014) – surveyed 29 intensive care nurses on their current practices with mechanical prophylaxis and problems experienced in maintaining therapy	<ul style="list-style-type: none"> Barriers to maintaining mechanical therapy; difficulty maintaining the velcro strap on the device, patient complaints of discomfort, limited sizing available, and difficulty mobilizing patients with IPC Nurses wanted more information on appropriate and minimum application time of mechanical devices, the effectiveness of devices in preventing DVTs, and effectiveness variations between devices (in combination and independently)

Results

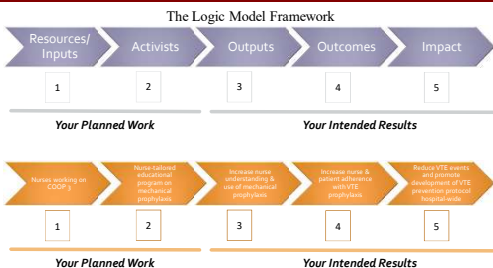


- Pre-test scores ranged from 2.4 to 4.2 out of a possible 5 points
 - The mean response rate was 3.6.
- Posttest scores ranged from 3.5 to 4.6.
 - The mean response rate was 4.3.
 - The average posttest response rate increased by 0.7 points compared to pre-test scores.
- Three questions showed greatest improvement in the posttest response:
 - Question 1: I have been formally trained on the use of sequential compression devices (SCD).
 - Posttest response increased by 1.3 points.
 - All nurses with 0-5 years of experience agreed to question 1 in the posttest.
- Question 4: I am familiar on when to use foot pumps as an SCD device.
 - Posttest response increased by 1.2 points.
- Nurses with greater years of experience were more likely to have experience with foot pumps prior to the program.
- Question 6: When a patient is sitting in the chair, I maintain the SCD device.
 - Posttest response increased by 1.1 points.
- More neutral and disagree responses in the posttest compared in questions 1 and 4 by all experience groups.

Implications for Advanced Practice

- Nurse Practitioners (NP) serve as role models in analyzing, translating, and bringing evidence-based research to the bedside. They also serve as patient advocates in populations at high-risk for adverse events, including VTE events.
- NPs may participate in root cause analysis to determine the original contributor of VTE events within an organization and provide quality and safety personnel with current practice recommendations to guide education.
- A formal nursing policy on the use and function of mechanical prophylaxis may contribute to greater compliance among nurses at Rhode Island Hospital.
- Technology, such as incorporating automated practice reminders within the electronic medical record that alert nurses to not only screen patients on admission for at risk factors of VTE, but promote mechanical therapy usage can aid in greater compliance.
- Policy efforts at the national level must endorse public safety awareness on the seriousness of VTE. A more informed population will advocate for proactive care.
- Further research is needed to determine if by mandating such a program during new hire orientation or in yearly competencies would increase compliance with mechanical prophylaxis and decrease VTE events hospital-wide. Additionally, educating physicians and advanced providers on mechanical prophylaxis removes the burden of preventative care and involves all team members.

Theoretical Framework



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