AN EXPERIMENTAL STUDY ON THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME AMONG THE CLINICAL NURSES' PERCEIVED KNOWLEDGE AND PRACTICE IN DEEP VEIN THROMBOSIS

Nursing

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ABSTRACT

The research aimed at finding the effectiveness of structured teaching programme related to Deep vein Thrombosis on knowledge and practice among staff nurses. One-group pre-test and post-test methods of pre-experimental design were taken. The samples for the study were chosen by non-probability purposive sampling. 30 clinical nurses were selected as sample based on the selection criteria. A structured interview schedule and observational checklist was developed based on review of literature and opinion from experts. Level of knowledge was studied in relation to various aspects like knowledge on anatomy & physiology, aetiology, risk assessment and preventive management. Data were collected from clinical nurses who were working at 200 bedded Cardiac speciality Hospital. The findings of the study were: The existing level of knowledge on clinical nurses was inadequate 20(66.7%) and the existing practice level was inadequate among 14(46.7 %) clinical nurses. Exposure to the structured teaching programme and emphasising the usage of Wells Score increased the knowledge ('t' value 10.62) and practice level ('t' value 13.24) among clinical nurses. Some of the selected background factors like years of experience and previous exposure to DVT class were not associated whereas level of education (B.Sc. and G.N.M.) was associated with knowledge and practice level among clinical nurses regarding Deep Vein Thrombosis. Thus, the study concluded that effective teaching programme can improve both knowledge and practice level of clinical nurses. A similar study could be undertaken on a larger scale for making a more valid generalization

KEYWORDS

Wells Score, Homan's Sign

BACKGROUND
Hospital Acquired Deep vein Thrombosis is a common complication of hospitalization and is associated with significant morbidity and mortality if not recognized and treated effectively.

In India , Study conducted by A.D.Lee et al (2009) for ten years (1996-2005)at CMC Vellore had revealed that avg 17.5 -24 patients out of 10,000 patients get admitted with DVT. VTE is no longer a rarity in India. General surgical operations are the most common causes of postoperative DVT. Pulmonary embolism continues to be 'suspected' more often than it is diagnosed. Further a retrospective study by Kamerkar et al (2016) show a significant increase in acute DVT (±PE) from 2006 to 2010. This can be explained by the increased awareness of VTE in India as well as the advent of better diagnostic modalities, such as duplex ultrasonography becoming more readily available and accepted. Although there was no significant change in the number of PE cases from 2006 to 2010, the burden of PE is almost double (13% of all VTE) of 7%, rate reported at Christian Medical College, Vellore during a 10-year period from 1996 to 2005. Therefore, Clinical nurses can play a major role in improving venous thromboembolism prevention care, assessing venous thromboembolism risks and providing appropriate prophylactic measures to those who are at risk for venous thromboembolism.

AIM
To implement Homans sign and Wells Score in regular assessment of nursing practice and also to improve the clinical nurses' understanding about the scientific rationale behind DVT prevention.

OBJECTIVES
1. To assess the existing level of knowledge regarding Deep Vein Thrombosis among clinical nurses before and after structured teaching programme.

2. To assess the existing practice regarding Deep Vein Thrombosis among clinical nurses before and after structured teaching programme.

3. To evaluate the effectiveness of structured teaching programme on knowledge and practice regarding Deep vein Thrombosis among clinical nurses.

4. To evaluate the existence level of correlation between post-test knowledge and practice among clinical nurses regarding Deep Vein Thrombosis.

5. To find the association between selected background factors of clinical nurses and the level of knowledge and practice regarding Deep Vein Thrombosis.

CONCEPTUAL FRAMEWORK
The Communication Model by Shannon and Weaver is applied in this study
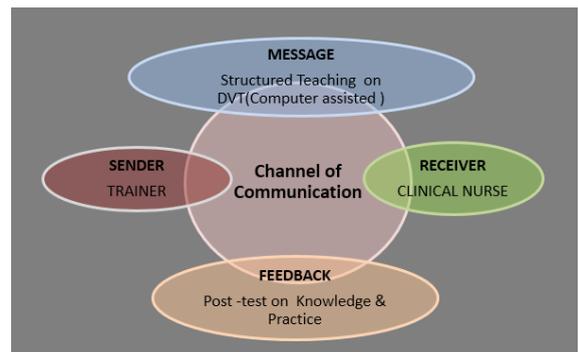
METHOD AND DESIGN
Methods and Procedure:
To find the effectiveness of an intervention, an evaluatory approach will be the best suited. In this study, the investigator desired to evaluate the effectiveness of a structured teaching programme on Deep Vein Thrombosis among clinical nurses.

Research Design:
The symbolic presentation of the research design is:-

$$K_1P_1 \qquad X \qquad K_2P_2$$

Where symbol stand for:
- K_1 = Pre-test knowledge score
- P_1 = Pre-test practice score
- X = Intervention through structured teaching programme on Deep Vein Thrombosis
- K_2 = Post-test knowledge score
- P_2 = Post-test practice score

Variables
Independent variable was structured guidelines on Deep vein Thrombosis and the *Dependent variable* were (i) Knowledge on Deep Vein Thrombosis and (ii)Practice on Deep vein Thrombosis.

Background Variable for each clinical nurse's age, sex, educational qualification,years of experience and previous exposure to DVT class were assessed and recorded.

Settings
In this study, Clinical nurses from a 200 bedded cardiac speciality hospital was chosen to be the best setting.

Population
All the Clinical Nurses in Preoperative, Post-operative, and Criticare units.

Sample and Sample Size
In this study, the samples were Clinical nurses who are working in the 200 bedded cardiac speciality hospital. The sample size was 30, considering the availability of sample and as per inclusion criteria.

The Sampling Technique
The researcher considered non probability purposive sampling as sampling technique.

The following sample selection criteria are considered:-
Inclusion criteria
• Nurses who work at bedside
• Nurses of both the sex
• Nurses with age limit of 21 years and above
• Nurses with the qualification of GNM and B.Sc (N).
• Nurses of Criticare unit, Preoperative and Post operative wards

Exclusion criteria
• Nurses who work as ICN, Managers, educators
• Nurses with the qualification above B.Sc.(N)
• Nurses with the qualification of ANM.
• Nurses of Emergency, OT and Cathlab
Research Tool

VARIABLES	TOOL	TECHNIQUE
Background data	Interview Schedule	Interviewing
	- Part A	
Knowledge	- Part B	Interviewing
Practice	Observational Checklist	Observation

As a tool the researcher had used structured interview schedule to assess knowledge and observation checklist to assess the practice level.The knowledge questionnaire was categorized into:- (i) anatomy and physiology, (ii) aetiology (iii) risk assessment tool (iv) prevetive management. Observation Checklist was made on areas : -(i) history taking (ii) skin inspection (iii) risk assessment practice(iv) preoperative practice (v) postoperative practice (vi) documentation and reporting and (vii) discharge education to patients.

Validity:-The tool and the structured teaching programme were validated by five experts including three post graduate nurses and two medical experts. The items were evaluated for clarity, relevance and appropriateness. The items with 100% agreement were included in the structured interview schedule. Few items were modified and included.

The reliability of the structured interview schedule was tested by test-re-test method. Reliability was computed using Karl Pearson's Correlation Coefficient method, r = 0.87. The reliability of observation check list was measured using interrater reliability. The coefficient of correlation was computed by using Karl Pearson's Correlation Coefficient method, r = 0.85. The reliability coefficient was found to be high. Thus the tools were found to be reliable for data collection.

Modified Wells Criteria: Clinical Evaluation Table for Predicting the Probability of a DVT	
Clinical Characteristic(s)	Score
Active cancer	+1
Paralysis, paresis, or recent plaster immobilization of the lower extremities	+1
Recently bedridden for three days or major surgery within the last 12 weeks	+1
Localized tenderness along the deep venous system	+1
Entire leg swollen	+1
Calf swelling ≥ 3 cm larger than asymptomatic side	+1
Pitting edema confined to symptomatic leg	+1
Collateral superficial veins	+1
Previously documented DVT	+1
Alternative diagnosis at least as likely as a DVT	-2
Clinical Probability of DVT	Total Score
Likely	< 2
Unlikely	≥ 2

Wells Score for DVT Risk Assessment

Data Collection Procedure
In coordination with Nursing Administration, education team and in charges written consent were taken from each clinical nurse. Each clinical nurse was assessed for their perceived knowledge level on Deep Vein Thrombosis with an interview schedule. Current nursing practice was assessed by observation checklist. Intervention was given through a computer assisted teaching guidelines and usage of Wells Score was emphasised. The teaching module highlighted the aetiology of DVT, risk assessment, complications of DVT and best practice in DVT prophylaxis and clinical evidence guidelines. After one week the feedback were taken through post-test knowledge assessment and practice. Recapitulation of the teaching guidelines was made through an interactive session. Project work (to detect a case and perform risk assessment) was assigned to each nurse for better understanding about DVT. At the end of the session Clinical Nurse was acknowledged by thanksgiving. Like this 30 data were collected.

Results
Background Variables
In this study, major background factors of clinical nurse such as age, sex, education, experience and previous exposure to any DVT class was considered. Further out of the nurses who had earlier attended DVT class; total number of classes exposed was also taken into consideration. In regard to age 7 (23.3 %) had age more than 25years whereas 23 (76.7 %) of clinical nurses were aged between 21-25 years. Further, 22 (73.3%) were female nurses compare to 8 (26.7 %) male nurses. Regarding educational qualification majority 23(76.7%) were B.Sc. Nursing whereas rest 7(23.3 %) were GNM. With regard to experience, 9 (30%) nurses had working experience of about one year whereas 21(70%) nurses had working experience of more than one year in the hospital. About 13 (43.3%) nurses had previous exposure to DVT class whereas 17 (56.7%) had not attended any DVT class so far. Further, out of 13 nurses who had previous exposure to DVT class, 10(77%) had attended only one class whereas 3 (23 %) had attended more than one class.

Significant Difference Between Pre And Post Test Knowledge Score:-
Study findings revealed that in pre- test, majority of the clinical nurses 20 (66.7%) had overall inadequate knowledge and least of them 10 (33.3%) had moderate knowledge regarding Deep Vein Thrombosis before the administration of structured teaching programme (pre-test). With regard to the knowledge on Deep vein Thrombosis ,majority of the clinical nurses 25 (83.3%), 26 (86.7%), 28 (93.3%) and 20 (66.7%) had inadequate knowledge regarding Anatomy & Physiology, Aetiology ,Risk Assessment and Preventive Management on Deep Vein Thrombosis whereas 3 (30%), 4 (27%), 2 (30%) and 10 (24%) were having moderate knowledge respectively. Regarding Anatomy and Physiology only 2 (6.7%) had adequate knowledge.
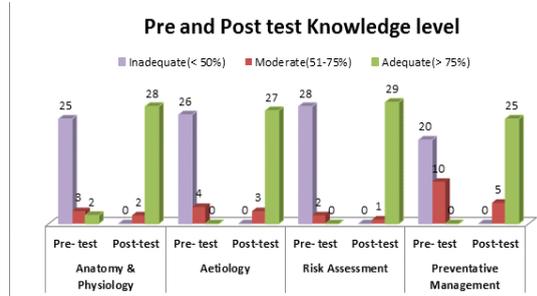
Fig 1 :- Comparison of pre-test and post- test score on knowledge among clinical nurses

In post- test, none of the clinical nurses had inadequate knowledge and 7(23%) had moderate knowledge and 23 (77%) had adequate knowledge regarding Deep Vein Thrombosis.

In post-test, majority of the clinical nurses 28 (93.3%), 27 (90%),29 (96.7%) and 25 (83.3%) reported adequate knowledge regarding Anatomy & Physiology, Aetiology ,Risk Assessment and Preventive Management on Deep Vein Thrombosis. Regarding overall knowledge, majority of staff nurses 23 (76.7%) reported adequate and 7 (23.3%) reported moderate knowledge. There was none (0%) who reported inadequate knowledge.

Hypothesis:-

H_1 - There will be a significant difference between pre-test and post-test knowledge level among clinical nurses regarding Deep Vein Thrombosis. $K_1 \neq K_2$

H_{01}- There will be no significant difference between pre-test and post-test knowledge among clinical nurses regarding Deep Vein Thrombosis. $K_1 = K_2$
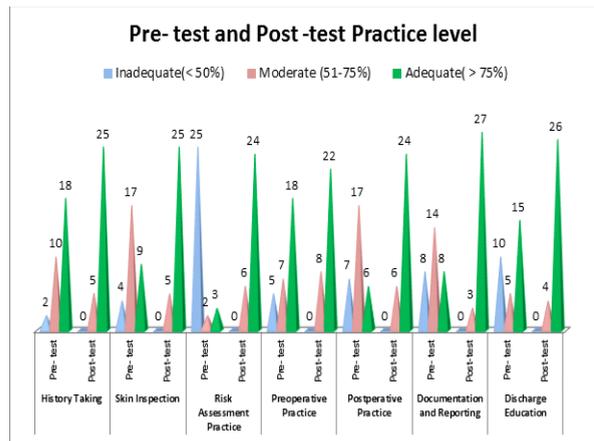
Table1 shows significant difference between pre- test and post-test knowledge score

SIGNIFICANT DIFFERENCE BETWEEN PRE AND POST TEST KNOWLEDGE SCORE					
					$N = 30$
GROUP	LEVEL	MEAN KNOWLEDGE SCORE	MEAN DIFFERENCE	STANDARD DEVIATION (SD)	't' value
Clinical Nurses	Pre - test	9.53	7	3.28	10.62
	Post- test	16.53		1.18	
					p< 0.05

The mean difference between the pre-test and post-test knowledge was 7. The obtained 't' value 10.62 (p < 0.05) calculated was significant at 0.05 level. Hence the null hypothesis (H_{01}) was rejected and the research hypothesis (H_1) was accepted. There was significant difference in knowledge regarding Deep Vein Thrombosis before and after the administration of structured teaching programme. It was inferred that the knowledge was significantly increased after the structured teaching programme. Hence the structured teaching programme was found to be effective to enhance the knowledge of clinical nurses.

Significant Difference Between Pre And Post Test Practice Score:-
The data on frequency and percentage distribution on existing practice level among clinical nurses was also analysed. With regard to practice on Deep vein Thrombosis, 14 (46.7%) were having inadequate practice level and 16 (53.3%) were having moderate practice level before the administration of structured teaching programme (pre-test)

Fig 2 :- Comparison of pre-test and post- test score on practice among clinical nurses

Hypothesis:-

H_2 - There will be a significant difference between pre-test and post-test practice level among clinical nurses regarding Deep Vein Thrombosis. $P1 \neq P2$.

H_{02} - There will be no significant difference between pre-test and post-test practice level among clinical nurses regarding Deep Vein Thrombosis. $P1 = P2$.

Table2 shows significant difference between pre- test and post-test practice score

SIGNIFICANT DIFFERENCE BETWEEN PRE AND POST TEST PRACTICE SCORE					
					N=30

GROUP	LEVEL	MEAN KNOWLEDGE SCORE	MEAN DIFFERENCE	STANDARD DEVIATION (SD)	't' value
Clinical Nurses	Pre - test	12.3	4.86	2.21	13.24
	Post- test	17.17		1.48	
					p< 0.05

The Table no 2 shows the comparison between pre-test and post-test practice level. The improved mean was found to be 4.86 . The 't' value 13.24 calculated was significant at 0.05 level. Hence the null hypothesis (H_{02}) was rejected and the research hypothesis (H_2) was accepted.

Therefore, it was inferred that there was a significant difference between pre-test and post-test practice level among clinical nurses. Hence the structured teaching programme was found to be effective to enhance practice score of clinical nurses.

Data On Correlation between Post-Test Knowledge And Practice Level Regarding DVT Prevention The data on post – test knowledge and post-test practice was analysed and studied to see the correlation existing between knowledge and practice level.

Hypothesis:-

H_3 - There will be correlation between post -test knowledge and post-test practice level among clinical nurses regarding Deep Vein Thrombosis. $P1 \neq P2$.
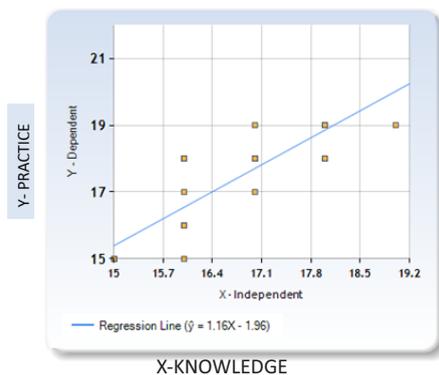
H_{03} - There will be no correlation between post -test knowledge and post-test practice level among clinical nurses regarding Deep Vein Thrombosis. $P1 = P2$.

Table3 shows correlation between post- test knowledge and post-test practice score

		KNOWLEDGE	PRACTICE
KNOWLEDGE	Pearson Correlation	1	0.8703
	Sig.(2-tailed)		9.2E-05
	N	30	30
PRACTICE	Pearson Correlation	0.8703	1
	Sig.(2-tailed)	9.2E-05	
	N	30	30

** Correlation is significant at the 0.05 level

Table 3 shows the correlation between knowledge and practice score. The value of R was 0.8703. This was a strong positive correlation, which means that high Knowledge scores go with high practice scores (and vice versa). The value of R2, the coefficient of determination, was 0.7574. The p-value was 9.2E-05. The result was significant at p < 0.05

Fig 3 :-Graph on Linear Regression between post-test knowledge and practice among clinical nurses

Figure 3 shows the graph on linear regression present between knowledge and practice score among clinical nurses regarding Deep Vein Thrombosis.

Data On Association Of Background Variables On Post-Test Knowledge And Practice Level Regarding Deep Vein Thrombosis
The selected background factors considered by the researcher to test the association with the knowledge and practice regarding Deep Vein Thrombosis were: previous exposure on DVT class, educational qualification and months of experience . These background factors were compared with both post-test knowledge and practice level and the association was tested among them by using chi-square test.

(A) ASSOCIATION WITH PREVIOUS EXPOSURE TO DVT CLASS

Table 4 shows association between experience and post-test knowledge

ASSOCIATION BETWEEN PREVIOUS EXPOSURE TO DVT CLASS AND POST-TEST KNOWLEDGE					
					$N= 30$
DVT CLASS	Moderate		Adequate		Chi –square 'χ^2' Value
	n	%	n	%	
Attended	1	3.3	12	40	3.14
Not attended	6	20	11	36.7	
					p< 0.05

The chi-square statistic was 3.137. The p-value was 0.076518. The result was statistically not significant at p < 0.05. There was no significant association between previous exposure to DVT class and post-test knowledge among clinical nurses.

Table 5 shows association between experience and post-test practice

ASSOCIATION BETWEEN PREVIOUS EXPOSURE TO DVT CLASS AND POST-TEST PRACTICE					
					$N= 30$
DVT CLASS	Moderate		Adequate		Chi –square '$\chi2$' Value
	n	%	n	%	
Attended	2	6.6	11	36.7	1.49
Not attended	6	20	11	36.7	
					p < 0.05

The chi-square statistic was 1.493. The p-value was 0.2217. The result was statistically not significant at p < 0.05. There was no significant association between previous exposure to DVT class and post-test practice among clinical nurses.

(B) ASSOCIATION WITH EXPERIENCE

Table 6 shows association between experience and post-test knowledge

ASSOCIATION BETWEEN EXPERIENCE AND POST-TEST KNOWLEDGE					
					$N = 30$
EXPERIENCE	Moderate		Adequate		Chi –square '$\chi2$' Value
	n	%	n	%	
One Year	2	6.7	5	16.7	0.009
> One Year	7	23.3	16	53.3	
					p< 0.05

The chi-square statistic was .0089. The p -value was 0.9249. The result was statistically not significant at p < 0.05. There was no significant association between experience and post-test knowledge among clinical nurses.

Table 7 shows association between experience and post-test practice

ASSOCIATION BETWEEN EXPERIENCE AND POST-TEST PRACTICE					
					$N = 30$
EXPERIENCE	Moderate		Adequate		Chi –square '$\chi2$' Value
	n	%	n	%	
≤ One Year	3	10	5	16.7	0.29
> One Year	6	20	16	53.3	
					p< 0.05

The chi-square statistic was .292. The p -value was 0.589. The result was statistically not significant at p < 0.05. There was no significant association between experience and post-test practice among clinical nurses.

(C) ASSOCIATION WITH EDUCATION

Table 8 shows association between education and post-test knowledge

ASSOCIATION BETWEEN EDUCATION AND POST-TEST KNOWLEDGE					
					$N = 30$
EDUCATION	Moderate		Adequate		Chi –square 'χ^2' Value
	n	%	n	%	
B.Sc.	3	10	20	66.7	5.83
GNM	4	13.3	3	10	
					p< 0.05

The chi-square statistic was 5.834. The p -value was 0.0157. The result was statistically significant at p < 0.05. There was significant association between education and post-test knowledge among clinical nurses.

Table 9 shows association between education and post-test practice

ASSOCIATION BETWEEN EDUCATION AND POST-TEST PRACTICE					
					$N= 30$
EDUCATION	Moderate		Adequate		Chi –square '$\chi2$' Value
	n	%	n	%	
B.Sc.	4	13.3	19	63.4	4.34
GNM	4	13.3	3	10	
					p< 0.05

The chi-square statistic was 4.337. The p -value was 0.0373. The result was statistically significant at p < 0.05. There was significant association between education and post-test practice among clinical nurses.

Discussion:
Study findings revealed that majority of the clinical nurses 20(66.7%) had inadequate knowledge and 14 (46.7%) had inadequate existing practice level regarding Deep Vein Thrombosis. The study revealed that exposure to structured teaching programme had caused significant difference in knowledge ('t' value10.62) and practice ('t' value 13.24) level among clinical nurses. The findings were supported by the study done by Oh H, Boo S and Lee JAC (2017) Clinical nurses' knowledge and practice of venous thromboembolism risk assessment and prevention in South Korea: a cross-sectional survey. Journal of Clinical Nursing Feb;26(3-4):427-435.

This was a cross-sectional descriptive study conducted on 452 staff nurses to examine Korean registered nurses' level of perceived knowledge and practice of venous thromboembolism risk assessment as well as prevention, self-efficacy in venous thromboembolism care and actual knowledge of venous thromboembolism. The findings showed that overall venous thromboembolism knowledge and self-efficacy in venous thromboembolism prevention practices of Korean registered nurses' were not highly rated. Korean nurses demonstrated a lack of knowledge about venous thromboembolism, particularly in the areas of venous thromboembolism prophylaxis measures and venous thromboembolism diagnosis methods.

Further, the study is supported by Ruth McCaffrey, Mary Bishop and Marie Adonis-Rizzo (2007). Development and Testing of a DVT Risk Assessment Tool: Providing Evidence of Validity and Reliability .Worldviews on Evidence-Based Nursing; 4(1), 14–20 The purpose of this research project was to develop a DVT risk assessment tool and test the tool for validity and reliability. Providing a valid and reliable tool for measuring the risk for DVT or PE in hospitalized patients will enable nurses to intervene early in patients at risk. Basing DVT risk assessment on the evidence provided in this study will assist nurses in becoming more confident in recognizing the necessity for interventions in hospitalized patients and decreasing risk.

Recommendation:
A similar study can be undertaken on a larger scale for making a more valid generalization; on other aspects of management Deep Vein Thrombosis like comparison between various prophylactic measures etc. A similar study with patient can be conducted. Other methods of teaching can be adopted to teach the patient on Deep Vein Thrombosis.

Implication:
The implications of the findings had been discussed in relation to nursing service, nursing education, nursing administration and nursing research. Nursing Educators can plan different bed side teaching /classroom training modules covering various aspects of Deep Vein Thrombosis.

Nurse Managers can use the Research Tool as Audit tool to know the status of the HAT (Hospital Acquired Thrombosis) and can formulate SOP for JCI / NABH Accreditation. Nurse researcher can take up similar study in different aspects of DVT.

Conclusion:
The study findings conclude that an exposure to a good structured teaching programme on Deep Vein Thrombosis could improve the knowledge of the clinical nurses to assess DVT Risk assessment score correctly by standard tool like Wells Score. The condition of the risk status can be track down and recorded by the clinical nurses to plan nursing implementation. The study had also concluded that the level of education of clinical nurses (GNM/BSc.) had a significant impact in adaptability to the structured teaching programme and reciprocating in practice while taking care of patients under the risk of DVT.

Further, hospital could present an accurate data related to risk development of DVT so that effective strategy could be formulated and standard operating protocols could be filed. This in turn will benefit the hospital to face any kind of challenges of DVT especially in working for accreditation programme like NABH, Nursing Excellence and JCI.

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