



THE INVESTIGATION OF KNOWLEDGE, ATTITUDE AND PERFORMANCE OF OPERATING ROOM TECHNOLOGISTS OF EDUCATIONAL-THERAPEUTIC HOSPITALS OF ZAHEDAN UNIVERSITY OF MEDICAL SCIENCES REGARDING THE PREVENTION OF DEEP VEIN THROMBOSIS IN SURGERY CANDIDATE PATIENTS

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Abstract

Background and Purpose: One of the most dangerous and life-threatening complications after long-term surgery is Deep vein thrombosis. Surgery can play a specific role in the occurrence of this complication. One of the most important areas in any medical center where patients most deal with DVT complications is the operating room, and the knowledge of the personnel working in this department plays a significant role in preventing this complication. The importance of this issue led researchers to carry out this project with the aim of the determination of the level of knowledge and attitude of operating room personnel about deep vein thrombosis.

Materials and Methods: In order to perform this research, a demographic information questionnaire and researcher-made questionnaires were used to evaluate the level of knowledge, attitude, and performance of personnel, and statistical analysis of the data was performed by SPSS software version 21. In order to measure the relationship between quantitative and qualitative variables, independent t-test and ANOVA test were used.

Results: The findings of this study showed that the mean and standard deviation of surgical technologists' awareness was obtained at 44.96 ± 8.05 , which according to the Likert scale, the level of awareness was desirable. The mean and standard deviation of the attitude of surgical technologists was obtained at 17.41 ± 3.92 , which according to the Likert scale was a positive attitude, and the mean performance of the surgical technologists was obtained at 18.93 ± 4.5 , which according to the Likert scale was the level of intermediate.

Conclusion: In general, the implementation of DVT prevention protocol by hospitals may not be enough to reduce this complication in patients after surgery. The design and implementation of a training program on DVT prevention should be regularly required for all surgical technologists working in hospital operating rooms.

Keywords: DVT, Surgical Technologist, Attitude, Awareness, Performance.

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1. Introduction

One of the most dangerous and life-threatening complications after long-term surgery is deep vein thrombosis (1). Deep vein thrombosis (DVT) means the formation of abnormal blood clots in the vessels, especially the deep veins of the lower limbs and if the formed clots are displaced along with the blood flow, thus can lead to venous thromboembolism (2). The prevalence of this complication has been reported in about 130 to 395 people per 1000 patients (3). Among the factors affecting the occurrence of DVT complications can be implied factors such as high age, family history of DVT, use of certain drugs such as estrogens, intravenous catheters such as CVline and Shaldon, smoking, pregnancy, obesity, etc. (4). In addition to these factors, surgery can play a specific role in the occurrence of this complication. So that immobility before, during and after surgery is one of the most important effective factors in creating DVT and increases the probability of the occurrence of this complication up to 9 times. Since that long-term immobility increases venous stasis of blood and as a result increases the possibility of clot formation (5). Also, the extensive size of the surgical incision, the type of surgery, and the used drugs taken by the patient during the surgery can also affect the occurrence of DVT (6). By following the formation of a clot in the deep veins of the body, symptoms such as swelling and edema and pain in the leg and pain during dorsiflexion of the leg may appear, but sometimes DVT occurs without any symptoms (7). Therefore, in many cases, the occurrence of DVT is not diagnosed and the formed clots in the form of emboli cause blockage of the pulmonary vessels and ultimately the death of the patient (1). In addition, they may cause organ blood supply disruption in the long term (8). For this reason, prevention and timely and quick diagnosis of this complication have great importance. In order to diagnose, clinical examination methods such as the Human test (Foot dorsiflexion) can be used (9), and the use of paraclinical tests also helps us to better diagnose this complication (10). Another way to diagnose the probability of the occurrence of DVT is to use the Wells criteria which divides the patient into three categories of low, medium and high risk in terms of

the occurrence of DVT (2, 11). In order to prevent the occurrence of DVT, the use of mechanical methods, includes using of anti-varicose stockings and pneumatic stockings, and also the use of anticoagulants such as heparin and warfarin, can prevent the formation of clots and as a result, the risks created following it, to be minimized (12,13). This important thing happens when the medical staff can detect the occurrence of DVT in patients and prevent the next complications. Therefore, the level of knowledge of the medical staff and their familiarity with DVT, its symptoms, complications and ways to prevent and treat it, has great importance and the personnel should be well familiar with these things and be able to use their information and skills when needed in the best form. The importance of this issue led researchers to carry out this project with the aim of the determination of the level of knowledge and attitude of operating room personnel about deep vein thrombosis. Since that one of the most important areas in any medical center where patients most deal with DVT complications is the operating room, and the knowledge of the personnel working in this department plays a significant role in preventing this complication. Finally, using the results of this research, hospitals can become aware of the level of awareness and knowledge of their personnel and try to strengthen and increase it by holding educational workshops.

2. Materials and methods

This research is a descriptive-cross-sectional study. The research population consists of surgical technologists working in Imam Ali (AS), Al-Zahra Medical Eye and Khatam Al-Anbia hospitals of Zahedan University of Medical Sciences. In order to determine the required sample size at the confidence level of 95% and the error value of 0.05, considering the determination of the size of the population, the following formula was used after replacement in the formula, the sample size was calculated for 52 people which according to the probability attrition bias, it is added 10% to the sample size and the sample size was calculated for 60 people.

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

N: 60 1.96: z p=q=0.5 d: 0.05

The research samples in this study include the operating room technologists of educational-therapeutic hospitals in Zahedan City, who will be selected randomly.

The inclusion criteria into the study include surgical technologists working in the educational hospitals of Zahedan University of Medical Sciences, who have the desire to participate in the study and have at least 6 months of work experience and people who do not desire to participate in the study, were abandoned of the study. The tools used in this research include a demographic information questionnaire (Including age, gender, marital status, work history, level of education, training course history related to deep vein thrombosis, and type of employment), knowledge assessment questionnaire (Including 25 questions that the knowledge of surgical technologists examines on how to develop deep vein thrombosis, risk factors of it in the operating room, and preventive measures for deep vein thrombosis in the operating room. According to this tool, each question has three options are as follow: Yes, No, I don't know. For Yes option 2 scores, for No option 1 scores and for I don't know option zero scores have been considered. The minimum score obtained from this questionnaire is zero and the maximum score obtained from this questionnaire is 50. This tool has three desirable levels (34-50), relatively desirable (17-34) and undesirable (0-17) are classified, attitude measurement questionnaire (This questionnaire measures the surgical technologists in the prevention of deep vein thrombosis in the operating room, which includes 10 statements and the measurement criteria are based on the answers of completely I agree (5), I agree (4), I have no opinion (3), I disagree (2) and completely I disagree (1). The minimum score of this questionnaire is 1 and the maximum score obtained from this questionnaire is 50. The negative attitude (less than 15), normal attitude (15-30), and positive attitude (higher than 30) are classified, in the performance measurement questionnaire (This questionnaire measures the actual and visible behaviors of surgical technologists in the prevention of deep vein thrombosis in the operating room, which includes 10 statements). In the field of performance, each option has provided for option always 3 score, sometimes 2 score, and for option never 1 score. The minimum score of this

questionnaire is considered equal to 1 and the maximum score obtained from this questionnaire is equal to 30. The performance level at low levels (1-10), moderate (10-20) and high (20-30) are classified. These researcher-made questionnaires were designed by reviewing the texts and questionnaires of other related and similar studies, and to confirm the validity, the researcher-made tool was provided for 10 people experts and authorities from the faculty members, and the objectives of the test were explained to them. The face validity of the questionnaire was investigated in terms of its appearance face and the questions were examined in terms of their writing and readability. The content validity was evaluated quantitatively and by calculating the Content Validity Index (CVI) and the Content Validity Ratio (CVR) were calculated. To calculate the CVR, the experts were asked to classify each of the questions based on the three-part Likert scale, which are as follows: The item is necessary, the item is useful but not necessary, and the item is not necessary.

Then, according to the following formula, the content validity ratio was investigated based on Lawshe method.

$$CVR = \frac{n_e - \frac{n}{2}}{\frac{n}{2}}$$

In this formula, n_e represents the number of experts who selected for each question (The item is necessary) option. The parameter n also represents the total number of experts. This index changes between $+1$ and -1 . It should be mentioned that the minimum acceptable value in Lawshe's method was equal to 0.62 due to the participation of 10 experts in the study. To calculate CVI, experts were asked to determine the degree of relevance of each item with a four-part spectrum, which is as follows: Not relevant, need basic revision, relevant but need revision, and completely relevant. We divided the number of experts who selected options 3 and 4 based on the total number of experts. If the obtained value is smaller than 0.7, the item is rejected and if this value is between 0.7 and 0.79, it should be revised, and if this value greater than 0.79, it is acceptable. The reliability of the questionnaires was also evaluated using the internal consistency method among a group of 10 operating room employees. After receiving the code of ethics and

receiving the letter of introduction from the vice president of research and obtaining the necessary permission to attend the operating room, to comply with the ethical considerations of the researcher by introducing himself and explaining the objectives of the study and the research method, after obtaining the informed consent of the participants and ensuring confidentiality individual information and this fact that completing the questionnaires was optional, so the questionnaires were provided to the surgical technologists who met the inclusion criteria and were willing to participate in the study. After completing the questionnaires, data were collected for analysis. Data analysis was performed using

SPSS21 statistical software and for quantitative variables, the mean and standard deviation and for qualitative variables, absolute frequency and percentage were provided. The Independent t-test and ANOVA test were used to measure the relationship between quantitative and qualitative variables.

3. Results

In this study, 60 surgical technologists working in the operating rooms of Zahedan University of Medical Sciences were examined. The results showed that 39.84 surgical technologists were male and 59.76 were female.

Table 1: Demographic Information of the Operating Room's Technologists

Demographic characteristics	Subgroup	Frequency	Percentage
Gender	Male	24	39.84%
	Female	36	59.76%
Type of employment	Formal	39	64.74%
	Contractual	9	14.94%
	Plan	12	92.19%
Level of education	Post-diploma	1	1.66%
	Bachelor	59	97.94%
Marital status	Single	24	39.84%
	Married	36	59.76%
Work experience	Under 10 years	35	58.1%
	10-20 years	19	31.54%
	20-30 years	6	9.96%
Age	20-30 years	24	39.84%
	31-40 years	25	41.5%
	41-50 years	5	8.3%
	51-60 years	6	96.9%

In the examination of the studied units, the mean and standard deviation of surgical technologists' knowledge was obtained at 44.96 ± 8.05 , which according to the Likert scale, the level of awareness was desirable.

After the examination of the studied units, the mean and standard deviation of surgical

technologists' attitude was obtained at 17.41 ± 3.92 , which according to the Likert scale, it was a positive attitude.

The average performance of surgical technologists was obtained at 18.93 ± 4.5 , which according to the Likert scale, it was placed on the medium level.

Table 2: The Frequency Distribution of the Samples Responses the Questions of the Performance Measurement Questionnaire Regarding the Prevention of DVT (n=60)

Questions	Never		Sometimes		Always	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
'I know DVT risk assessment scales in the operating room'	27	45.0	24	40	9	15
'I assess the risk of DVT in surgical candidates patients'	36	60	20	33.3	4	6.7
'I pay attention to DVT risk factors when admission of patients'	33	55	19	31.7	8	13.3
'I select DVT preventive measures for the surgical candidate patients'	21	35	35	58.3	4	6.7

'After admitting the patient to the operating room, I ask the patient to do active leg exercises until the start of anesthesia.'	34	56.7	14	23.3	12	20
'I use elastic stockings/bandages to prevent DVT in surgical patients.'	18	11.7	35	58.3	7	30
'Before using elastic bandages, I investigate the patient's sensitivity to latex.'	19	31.7	24	40	17	28.3
'I use intermittent pneumatic compression devices to prevent DVT in surgical patients.'	29	48.3	16	26.7	15	25
'During the surgical time out, I report the risk of the occurrence DVT in the patient to the surgical team.'	14	23.3	26	43.3	20	33.3
'I examine patients in terms of signs and symptoms of DVT after surgery.'	28	46.7	11	18.3	21	35

4. Discussion

Deep vein thrombosis is one of the most dangerous complications after long-term surgery (1). In this study, the average level of awareness of the participants was reported as desirable. In a study which is conducted by Alameri et al. in 2019 with the aim of knowledge and attitude towards venous thromboembolism for surgeons of two medical centers in Saudi Arabia, the results obtained of the investigation of participants' awareness were estimated desirable in line with the current study (14). In a study which is conducted by Alnaser et al. in 2021 with the aim of knowledge and attitude towards venous thromboembolism among professional drivers in Saudi Arabia. Less than one-third (31.8%) of drivers were aware of VTE (15). Since the studied samples in this study were drivers, this difference can be justified in the results because all the people participating in the present study were surgical technologists and usually all the medical staff during the study of courses related to deep vein thrombosis should be studied, but the participants in this study are less likely to have passed courses related to this field during their studies. In a study which is conducted by Gashi et al. in 2018 in Sudan, with the aim of knowledge, attitude and performance of orthopedic specialists regarding the prevention of venous thromboembolism (16), the registered knowledge of orthopedic specialists about VTE was less than optimal level. The difference in the sample size and the small sample size in this study can be the reason for this difference in the results. On the other hand, the majority of the participants (88.5%) were male. This factor itself can greatly affect the results, in a study which is conducted by

Alshammary and et.al, the results showed that females not only have better knowledge, but also their exercise behavior is far better than male respondents (86% vs. 80%, $P > 0.05$) (17); and since that the majority of participants in this study were male, but in the present study, the majority of participants (59.76 %) were females, this can be the reason of this difference in the results. Also, Yohannes et al.'s study was consistent with the present study (18). In the present study, the average attitude of the participating surgical technologists was evaluated as a positive attitude. In a study which is conducted by Li et al. in 2018 with the aim of knowledge and attitude of nurses about the major complications of immobility in hospitalized patients (19). In this study in line with the current study, clinical nurses had a relatively positive attitude. Also, in a study which is conducted by Alameri et al., the results obtained from investigating the attitude of the participants were positive in line with the present study (14). In a study which is conducted by Gashi et al. (16), the registered attitude of orthopedic specialists about VTE was less than optimal level, the difference in the studied samples size can be an effective factor in this difference in the results, because, in this study, the number of participants was only 52 people of orthopedic specialists. On the other hand, the age range of the studied samples in this study was from 23 to 32 years, while in the present study, the age of the participants was from 20 to 51 years, and since that, it can be said that the participants had not a lot of work experience compared to the participants of the present study, this difference in the results can be justified. The present study concluded that the performance average of the surgical technologist

personnel studied was at a medium level. In the study of Gashi et al (16), consistent with the present study, the majority (71.2%) had moderate performance while only 8 (15.4%) physicians had a good performance and 7 (13.5%) had poor performance compared to VTE prophylaxis. In a study which is conducted by Yohannes et al. in 2022 in Ethiopia, with the aim of investigation of nurses' knowledge, perceived performance, and their related factors regarding the prevention of deep vein thrombosis in comprehensive specialist hospitals in the Amhara region, unlike our study, the result of nurses' performance was reported good that the results obtained in the field of personnel performance in the field of performing preventive behaviors against deep vein thrombosis were 48.8% (18). In this study, the number of participants was 423 people which was greater than the current study, where the number of participants was 60 people. Considering that the higher the number of people participating in the study, the more likely participants with higher educational degrees participate in the study, this difference in the results can be justified. The present study, like all studies, had limitations which among these limitations can be implied by the small number of participants and also the limitation of the participants to surgical technologists in the study, and it is proposed that this study with a larger number of participants has also been done for other hospitals and all people participating during surgery such as surgeons, anesthetists nurses and paramedics and it is attempted by designing and implementing training classes to increase the knowledge and attitude and performance of medical staff to prevent DVT in patients under surgery as much as possible.

5. Conclusion

In general, the results obtained from the present study show the knowledge and positive attitude of the participants and their average performance. On the other hand, the implementation of DVT prevention protocol by hospitals may not be enough to reduce this complication in patients after surgery. The design and implementation of a training program on DVT prevention should be conducted regularly for all surgical technologists working in the operating rooms of the studied hospitals.

Conflict of interest

The authors reject any conflict of interests of the present research with individuals or organizations which are somehow related to the performed study.

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