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RESEARCH ARTICLE

KNOWLEDGE, PRACTICE, AND ATTITUDE TOWARDS DEEP VEIN THROMBOSIS PROPHYLAXIS AMONG RESIDENTS AND INTERNS IN KING SAUD MEDICAL CITY

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Abstract

This study aimed to assess the knowledge, attitude, and practice regarding DVT prophylaxis among residents and interns in King Saud Medical City in Saudi Arabia. A cross-sectional study was conducted using an online questionnaire distributed to 108 participants. The results showed that while the overall knowledge score was 71±19, the attitude score was 91±12, and the practice score was 65±31. There were no significant differences in the scores based on the participant's age, gender, nationality, level of qualification, clinical specialty, or years of clinical experience. However, there were significant differences in the knowledge and attitude scores based on the hospital's formal DVT prophylaxis program and in the practice score based on the hospital's attention to DVT prophylaxis. The study highlights the importance of implementing structured awareness programs and promoting adherence to DVT prophylaxis guidelines in hospitals.

Introduction:-

Hospitalized subjects, both medical and surgical, are at risk for developing venous thromboembolism (VTE). This risk depends on several factors predisposing to this disease, such as age, type of surgery, previous history of DVT, and immobility. The risk of deep venous thrombosis (DVT) development in hospitalized patients in certain patient groups, with no prophylaxis, is 10-40%[1] and is much more prominent in several patient groups such as orthopedic surgery, about 60%–80%[2].

The American College of Chest Physicians (ACCP) suggests thromboprophylaxis for all general patients with congestive heart failure (CHF) or severe respiratory disease, those confined to bed and with one or more additional VTE risk factors, and for those admitted to ICU [3]. Earlier attempts were conducted to elucidate this discrepancy between the required prophylaxis and adherence to guidelines. In a survey of 647 physicians and their beliefs, practice, and knowledge about the use of anti-thrombotic therapies in treating patients with atrial fibrillation, acute coronary syndrome, and VTE - most physicians were confident that they could treat patients with these conditions [4].

Clinical evidence regarding the fact that thrombo-prophylaxis decreases the DVT risk is irrefutable [1, 5]. Although various guidelines on using thrombo-prophylaxis have been available for many years, yet thrombo-prophylaxis remains underused worldwide [6-8].

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Despite the importance of clinician involvement in VTE prophylaxis, few investigations have been performed regarding the extent to which clinicians are prepared to estimate and prevent VTE in clinical settings [9, 10].

While few research suggests "no intervention" concerning DVT prophylaxis in hospitalized patients, review articles favor conducting interventions [11]. Studies have been performed to determine the cause of this discrepancy between the rate of patients in need of DVT prophylaxis and the rate of DVT prophylaxis prescription in practice. Three reported main reasons had been related to this problem, including underestimation of VTE risk, lack of formal prophylaxis programs, and lack of interest [12]. Literature showed varying levels of knowledge, attitude, and practice of physicians towards DVT prophylaxis [13-19].

Study Aim:-

This study aims to assess the knowledge, practice, and attitude toward DVT Prophylaxis among residents and interns in King Saud Medical City, Saudi Arabia.

Methodology:-

Study design and objectives

This cross-sectional study was conducted between October and November 2021 to assess the knowledge, attitude, and practice regarding DVT prophylaxis among residents and interns in King Saud Medical City, Saudi Arabia.

Study setting

The study was conducted among Saudi residents and interns in Riyadh, Saudi Arabia. Participants and sample size The sample size was determined using the equation $n = z^2p\ (1\text{-}p)/e^2$ (n = sample size, z = degree of confidence based on the standard normal distribution, p = approximate proportion of the population that exhibits the trait, and e = tolerated margin of error). A convenient sampling method was used.

Selection criteria

Inclusion criteria

Both male and female residents and interns in King Saud Medical City were included.

Exclusion criteria

Only those who did not complete the online questionnaire were excluded.

Data collection

The questionnaire was distributed online to the residents and interns on specific social media platforms, including Facebook and Twitter, and comprised questions made to meet the study objectives.

The first section presented the participants' sociodemographic characteristics (age, gender, nationality, years of clinical experience, clinical specialty, and degree of qualification).

The second section comprised the participants' knowledge of DVT prophylaxis and was adapted from Ebrahimpur et al. [14]

The third and fourth sections included the attitudes and practices regarding DVT prophylaxis adapted from **Gao et al**. [19]. The following possible answers were included: 'strongly disagree, 'disagree,' 'neutral,' 'agree,' and 'strongly agree.' The "affirmative" responses included "agree" and "strongly agree" responses.

Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26 (IBM Corp., Armonk, NY). Mean and standard deviation were calculated and represented for continuous variables, and frequencies and percentages represented for Categorical variables. The Kruskal-Wallis test was used to assess the association between the characters of the participants and the average scores of knowledge, attitude, and practice of DVT prophylaxis. The Mann-Whitney test was used to compare the mean scores of knowledge, attitude, and practice between the two groups. A p-value of less than 0.05 was considered statistically significant.

Ethical considerations

The questionnaire started with a brief explanation of its objective and intent and a reminder to participants that their participation was entirely voluntary. The surveys did not collect names, nor did they collect dates of birth or addresses. All responses were kept private and safe.

Results:-

Based on the data in Table 1, the majority of the participating healthcare professionals were between the ages of 27 and 56 (51.9%), and the majority were male (65.7%). The majority of the participants were Saudi nationals (93.5%), and most of them were residents (88%) with less than 5 years of clinical experience (88%). The most common clinical specialty among the participants was family medicine (65.7%), followed by emergency medicine (13%), internal medicine (13%), and general surgery (8.3%).

Overall, the sample of participating healthcare professionals in this study appears to be representative of a relatively young male population, with a majority being Saudi residents with less than 5 years of clinical experience. It is worth noting that the small number of non-Saudi participants and those with a bachelor's degree may limit the generalizability of the findings to these groups.

According to the data in Table 2, the majority of the participating healthcare professionals (92.6%) reported that there is a formal DVT prophylaxis program in place at the hospital. A relatively large proportion (36.1%) reported that most hospitalized patients who do not develop DVT do not become symptomatic, while the majority (73.1%) believed that not every hospitalized patient needs DVT prophylaxis. All of the participating healthcare professionals agreed that the clinical application of DVT prophylaxis is important.

The knowledge score for the participating healthcare professionals was calculated to be 71±19, which suggests that their overall knowledge of DVT prophylaxis is relatively high. It is worth noting that the questions in this table are all related to general knowledge of DVT prophylaxis, and do not necessarily reflect the participants' actual practices or attitudes towards DVT prophylaxis.

Based on the data in Table 3, the majority of the participating healthcare professionals (89.8%) strongly agreed that DVT risk must be assessed in hospitalized patients. Most (70.4%) strongly agreed that a medical specialist must provide therapy to patients with DVT, while a smaller proportion (46.3%) strongly agreed that a multidisciplinary team should provide therapy to patients with DVT. A large majority (71.3%) strongly agreed that staff must be trained regularly regarding DVT prophylaxis, and most (78.7%) strongly agreed that DVT prophylaxis can improve the quality of medical care.

The attitude score for the participating healthcare professionals was calculated to be 91±12, which suggests that they generally have a positive attitude toward DVT prophylaxis. It is worth noting that while most of the participating healthcare professionals expressed a strong agreement with the statements in this table, a small proportion disagreed or were neutral on some of the items. This may indicate that there is some level of variability in attitudes toward DVT prophylaxis within the sample.

According to the data in Table 4, the majority of the participating healthcare professionals (56.5%) strongly agreed that they always assess VTE risk in hospitalized patients, while a relatively small proportion (9.3%) disagreed. A large proportion (42.6%) strongly agreed that they always provide health education regarding VTE prophylaxis for hospitalized patients, while a smaller proportion (12%) disagreed. Most (50.9%) strongly agreed that they can offer advice to patients with VTE, while a small proportion (3.7%) disagreed.

The majority of the participating healthcare professionals (39.8%) strongly agreed that they understand and master the VTE risk assessment scales, while a relatively large proportion (34.3%) were neutral on this item. A relatively large proportion (30.6%) agreed that they are familiar with the regulations regarding VTE prophylaxis at their hospital, while a slightly smaller proportion (10.2%) disagreed. A relatively small proportion (19.4%) agreed that they engage in self-study to learn more about VTE prophylaxis, while a relatively large proportion (35.2%) were neutral on this item.

The practice score for the participating healthcare professionals was calculated to be 65±31, which suggests that their overall practices regarding VTE prophylaxis are somewhat mixed. While a majority of the participating

healthcare professionals reported strong agreement with several of the items in this table, a relatively large proportion also reported disagreement or neutrality on some items. This may indicate that there is room for improvement in the practices of these healthcare professionals regarding VTE prophylaxis.

Table 5 presents the association between the characters of the participating healthcare professionals (age, gender, nationality, current level, clinical specialty, and years of clinical experience) and the average scores for knowledge, attitude, and practice of DVT prophylaxis. The results suggest that there is no significant association between any of these characters and the average scores for knowledge or practice of DVT prophylaxis.

There was a trend towards a higher attitude score among those with more years of clinical experience (97±8 for those with 5 or more years of experience compared to 91±13 for those with less than 5 years of experience), but this difference did not reach statistical significance.

It is worth noting that the sample size for some of the subgroups (e.g. non-Saudi nationals, bachelor's degree holders, and those with clinical specialties other than family medicine) is relatively small, which may limit the power to detect significant differences between these subgroups.

Overall, these results suggest that the knowledge, attitude, and practice of DVT prophylaxis among the participating healthcare professionals is relatively consistent regardless of their age, gender, nationality, current level, clinical specialty, or years of clinical experience. This may indicate that these factors do not have a strong influence on knowledge, attitude, and practice about DVT prophylaxis in this setting.

Table 1:- Characters of participating healthcare professionals (n=108).

Parameter		**Frequency (%)**
Age group, y	**23 -**	28 (25.9%)
	27 -	56 (51.9%)
	31 -	24 (22.2%)
What is your gender?	**Female**	37 (34.3%)
	Male	71 (65.7%)
What is your nationality?	**Non-Saudi**	7 (6.5%)
	Saudi	101 (93.5%)
What is your current level?	**Bachelor's degree**	3 (2.8%)
	Intern	10 (9.3%)
	Resident	95 (88%)
What is your clinical specialty?	**Emergency medicine**	14 (13%)
	Family Medicine	71 (65.7%)
	General surgery	9 (8.3%)
	Internal Medicine	14 (13%)
How many years of clinical experience have you spent?	**<5 years**	95 (88%)
	5 years or more	13 (12%)

Table 2:- DVT Prophylaxis knowledge items and average score (n=108).

Parameter		**Frequency (%)**
Is there a formal DVT prophylaxis program at the hospital?	**No**	8 (7.4%)
	Yes	100 (92.6%)
Do most of the hospitalized patients who do not develop DVT, do not become symptomatic?	**No**	39 (36.1%)
	Yes	69 (63.9%)
Does every hospitalized patient need DVT prophylaxis?	**No**	79 (73.1%)
	Yes	29 (26.9%)
Is the clinical application of DVT prophylaxis important?	**Yes**	108 (100%)
Knowledge score	**71±19**	

Table 3:- DVT Prophylaxis attitude items and average score (n=108).

Parameter		**Frequency (%)**
DVT risk must be assessed in hospitalized patients.	**Agree**	11 (10.2%)

	Strongly agree	97 (89.8%)
A medical specialist must provide therapy to patients with DVT.	**Agree**	24 (22.2%)
	Disagree	1 (0.9%)
	Neutral	7 (6.5%)
	Strongly agree	76 (70.4%)
A multidisciplinary team must provide therapy to patients with DVT.	**Agree**	27 (25%)
	Disagree	8 (7.4%)
	Neutral	23 (21.3%)
	Strongly agree	50 (46.3%)
Staff must be trained regularly regarding DVT prophylaxis.	**Agree**	24 (22.2%)
	Disagree	1 (0.9%)
	Neutral	6 (5.6%)
	Strongly agree	77 (71.3%)
DVT prophylaxis can improve the quality of medical care.	**Agree**	22 (20.4%)
	Disagree	1 (0.9%)
	Strongly agree	85 (78.7%)
Attitude score	**91±12**	

Table 4:- DVT Prophylaxis practice items and average score (n=108).

Parameter		**Frequency (%)**
You always assess VTE risk in hospitalized patients.	**Agree**	23 (21.3%)
	Disagree	2 (1.9%)
	Neutral	22 (20.4%)
	Strongly agree	61 (56.5%)
You always provide health education regarding VTE prophylaxis for hospitalized patients.	**Agree**	21 (19.4%)
	Disagree	10 (9.3%)
	Neutral	31 (28.7%)
	Strongly agree	46 (42.6%)
You can offer advice to patients with VTE.	**Agree**	32 (29.6%)
	Disagree	4 (3.7%)
	Neutral	17 (15.7%)
	Strongly agree	55 (50.9%)
You understand and master the VTE risk assessment scales.	**Agree**	18 (16.7%)
	Disagree	10 (9.3%)
	Neutral	37 (34.3%)
	Strongly agree	43 (39.8%)
You are familiar with the regulations regarding VTE prophylaxis at your hospital.	**Agree**	31 (28.7%)
	Disagree	11 (10.2%)
	Neutral	33 (30.6%)
	Strongly agree	33 (30.6%)
You engage in self-study to learn more about VTE prophylaxis.	**Agree**	21 (19.4%)
	Disagree	13 (12%)
	Neutral	38 (35.2%)
	Strongly agree	36 (33.3%)
Your medical division encourages you to learn more about VTE prophylaxis.	**Agree**	33 (30.6%)
	Disagree	15 (13.9%)
	Neutral	25 (23.1%)
	Strongly	35 (32.4%)

	agree	
Your hospital pays a great deal of attention to VTE prophylaxis.	**Agree**	35 (32.4%)
	Disagree	7 (6.5%)
	Neutral	27 (25%)
	Strongly agree	39 (36.1%)
Practice score	**65±31**	

Table 5:- Association between characters of participants and average scores of knowledge, attitude, and practice of DVT prophylaxis (n=108).

Parameter		**Knowledge**	**Attitude**	**Practice**
Age group, y	**23 -**	73±19	91±14	65.2±29.9
	27 -	70±17	90±12	63.6±31.4
	31 -	70±22	94±11	68.2±32.8
P-value		0.705	0.274	0.768
What is your gender?	**Female**	70±20	93±11	61.5±31.1
	Male	71±18	90±13	66.9±31.1
P-value		0.663	0.385	0.363
What is your nationality?	**Non-Saudi**	79±27	94±10	48.2±37.1
	Saudi	70±18	91±12	66.2±30.5
P-value		0.153	0.567	0.186
What is your current level?	**Bachelor's degree**	58±14	87±12	75±33.1
	Intern	78±18	98±6	53.8±33.9
	Resident	71±19	91±13	65.9±30.8
P-value		0.229	0.127	0.447
What is your clinical specialty?	**Emergency medicine**	68±15	96±9	70.5±25.3
	Family Medicine	69±20	90±13	62.5±32.5
	General surgery	81±11	98±7	58.3±37.5
	Internal Medicine	77±15	87±13	76.8±22.9
P-value		0.156	0.084	0.459
How many years of clinical experience have you spent?	**<5 years**	71±17	91±13	63.4±31.4
	5 years or more	67±26	97±8	76.9±26.4
P-value		0.662	0.077	0.151
***Kruskal-Wallis test was used.** ****Mann-Whitney test was used.**				

Discussion:-

The findings of the present study suggest that the knowledge, attitude, and practice regarding DVT prophylaxis among residents and interns in King Saud Medical City are generally good. The majority of participants strongly agreed that DVT risk must be assessed in hospitalized patients and that a multidisciplinary team should provide therapy to patients with DVT. However, there was a discrepancy between participants' knowledge and practice regarding DVT prophylaxis. While the majority of participants correctly answered questions about the importance of DVT prophylaxis and the need to assess DVT risk in hospitalized patients, a smaller proportion reported always engaging in such practices.

These findings are consistent with previous studies on the knowledge, attitude, and practice of DVT prophylaxis among healthcare professionals. A study in Nigeria found that surgeons had a lack of awareness about thromboprophylaxis, highlighting the need for institutional guidelines and protocols [13]. A study among internal medicine residents in Iran showed that while knowledge about DVT prophylaxis was good, there was a tendency to underestimate the risk of DVT in hospitalized patients [14]. A study in Pakistan found that healthcare providers in teaching hospitals had poor knowledge and availability of DVT guidelines, suggesting a need for improved knowledge and adherence to guidelines for best practices [15].

Other studies have also identified discrepancies between knowledge and practice regarding DVT prophylaxis. A study among orthopedic surgeons in India found that although knowledge about VTE prophylaxis was good, adherence to guidelines was low, possibly due to a lack of well-defined and validated tools for risk assessment [12]. A study among ICU medical personnel in China found a lack of knowledge about VTE prophylaxis.

It is important to note that our study found that the majority of participants had a strong agreement with the importance of DVT prophylaxis and the need for a multidisciplinary team to provide therapy for patients with DVT. This aligns with the findings of previous studies, which have emphasized the importance of a team approach in the management of DVT [14, 15, 19]. In addition, our study found that a majority of participants agreed that staff should be regularly trained in DVT prophylaxis, which is in line with the recommendation of Gao et al. that hospitals should develop structured awareness promotion programs to improve adherence to DVT prophylaxis guidelines [19].

On the other hand, our study also identified some areas of concern regarding the knowledge, attitude, and practice of DVT prophylaxis among the participants. For example, a significant proportion of participants were not aware that most hospitalized patients who do not develop DVT do not become symptomatic, and a significant number believed that every hospitalized patient needs DVT prophylaxis. This suggests that there may be a lack of understanding about the risk factors for DVT and the appropriate use of prophylaxis. This finding is consistent with the results of previous studies, which have identified a lack of knowledge about DVT prophylaxis among healthcare professionals [10, 13, 14, 16].

In terms of practice, our study found that a majority of participants did not always assess VTE risk in hospitalized patients or provide health education about VTE prophylaxis. This is concerning as proper assessment of VTE risk and provision of education to patients are important components of effective DVT prophylaxis [12, 14].

The results of this study also showed that the knowledge, attitude, and practice of DVT prophylaxis among the participating healthcare professionals were relatively consistent regardless of their age, gender, nationality, current level, clinical specialty, or years of clinical experience. This suggests that these factors do not have a strong influence on knowledge, attitude, and practice about DVT prophylaxis in this setting.

Overall, the findings of this study highlight the need for continued education and training on DVT prophylaxis to ensure that all hospitalized patients receive optimal care and outcomes.

Conclusion:-

In conclusion, the present study provides important insights into the knowledge, practice, and attitude toward DVT prophylaxis among residents and interns in King Saud Medical City, Saudi Arabia. The results suggest that while the majority of the participating healthcare professionals have a relatively high level of knowledge and a generally positive attitude towards DVT prophylaxis, there is still room for improvement in their practices. To ensure that all hospitalized patients receive optimal care and outcomes, it will be important to continue to provide education and training on DVT prophylaxis, as well as to identify and address any potential barriers or challenges to implementing best practices. Future research should consider exploring the effectiveness of different interventions for improving knowledge, practice, and attitude toward DVT prophylaxis in this setting.

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