International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 10, Issue 05, May 2025,
https://doi.org/10.23958/ijirms/vol10-i05/2067

Original Article

Knowledge Assessment about Deep Vein Thrombosis among Women Using Combined Oral Contraceptive Pills

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Received: 03 April 2025; Accepted: 30 April 2025; Published: 05 May 2025

Abstract

Background: Deep vein thrombosis (DVT) is a serious condition, and its risk is heightened among women using combined oral contraceptive pills (COCPs). However, awareness of this risk and knowledge of preventive measures vary significantly. ***Objective:*** This study aimed to assess the knowledge of DVT and its associated risks among women using COCPs in the Western region of Saudi Arabia. ***Methods:*** A cross-sectional study was conducted in the western region of Saudi Arabia among 380 women aged 18 years or older, who were current or previous COCP users. Participants with a history of DVT or vascular diseases were excluded. The study was conducted from February 2024 to November 2024. Data were collected using a validated questionnaire and analyzed using SPSS version 26, with statistical significance set at $p < 0.05$. ***Results:*** The participants had a mean age of 31.9 years.Most participants were from Taif (51.1%), married (87.4%), and held university degrees (67.9%). While 50.5% had heard of DVT, only 55% recognized the increased risk associated with COCP use. The majority (56.3%) relied on the internet for information, but 62.9% were unaware of preventive measures. The median knowledge score was 2 out of 4, with women from Makkah scoring significantly higher ($P = 0.017$). ***Conclusion:*** This study reveals moderate awareness of DVT among women using COCPs, highlighting significant gaps in knowledge regarding preventive measures. Educational interventions are needed to enhance awareness and encourage discussions about the associated risks with healthcare providers.

Keywords: ***deep vein thrombosis, oral contraceptive pills, awareness, prevention, women.***

Introduction

Oral combined contraceptive pills (COCPs) are an effective method of pregnancy prevention and are also used to treat a variety of other conditions. However, like any medication, COCPs are associated with certain risks. These pills, which contain hormones that interact with the female reproductive system, are widely favored for their high effectiveness and good tolerability. One notable risk for women using COCPs is an increased likelihood of developing deep vein thrombosis (DVT), a condition that typically affects the legs and may result in pulmonary embolism, a potentially life-threatening complication [1].

Previous studies have linked all types of combined oral contraceptives to an elevated risk of venous thrombosis. Factors such as the progestogen used and the dose of ethinylestradiol are believed to influence this risk. Specifically, research indicates that the use of COCPs can increase the risk of venous thrombosis by two to six times. The estrogen component of these contraceptives, particularly ethinylestradiol, is considered to be a key factor in raising this risk [2].

Venous thromboembolism (VTE) is a major health issue, contributing to high rates of morbidity, mortality, and hospitalization. Despite the serious complications it may cause, VTE remains under-recognized in certain populations [3].

A study showed that the primary source of information regarding the risks of oral contraceptive pills is the internet. Health care providers play a critical role in improving women's understanding of family planning methods. Contraceptive choice is influenced not only by the effectiveness and convenience of the method but also by its side effect profile. Educational programs are essential to raise awareness about COCPs, alleviate concerns about side effects, and promote informed decision-making [4].

Women in the Western region of Saudi Arabia have demonstrated good knowledge and positive attitudes towards oral contraceptive pills, with a preference for COCPs over other methods. However, this positive perception does not always correlate with usage patterns. Early detection of venous thromboembolism in women using combined oral contraceptives is crucial, and healthcare professionals must be vigilant in recognizing early signs and discontinuing contraceptive use when necessary [5].

The primary aim of this study is to assess the level of awareness regarding DVT among women in the Western region of Saudi Arabia who are currently using COCPs for various health-related purposes.

Methods

This cross-sectional study was designed to assess the knowledge of deep vein thrombosis (DVT) among women using combined oral contraceptive pills (COCPs) in the Western region of Saudi Arabia. The study was conducted from February 2024 to November 2024, with ethical approval granted by Taif University (Approval No: HAO-02-T-105).

Study Population

The study targeted women aged 18 years and older who were current or past users of COCPs in the Western region of Saudi Arabia. Inclusion criteria required participants to be willing to provide informed consent and to have no known history of DVT or other vascular diseases. Women with cognitive impairments or those unable to understand or respond to the study questionnaire were excluded from participation.

Sample Size

The required sample size was estimated through the use of the Raosoft sample size calculator. A minimum of 377 participants was deemed sufficient, assuming a 95% confidence level, a 5% margin of error, and a 50% response distribution. To account for potential non-responses and incomplete data, the final sample size was increased to 380 participants.

Data Collection Tool

A self-administered questionnaire was used for data collection. The questionnaire organized into the following sections:

- *Demographic Information:* Age, city of residence, marital status, and educational level.
- *Use of Contraceptive Pills:* Current or past use of COCPs, duration of use, and reasons for starting contraceptive pills.
- *Knowledge of Deep Vein Thrombosis (DVT) and Contraceptives:* Awareness of DVT, knowledge of the association between contraceptive use and DVT, discussions with healthcare providers about the risks, and knowledge of preventive measures.
- *General Health and Lifestyle:* Medical conditions that may increase the risk of DVT, physical activity levels, family history of DVT, and the impact of DVT risk on contraceptive choices.

The questionnaire was pilot-tested on a sample of 20 women to ensure clarity and comprehensibility. Adjustments were made based on participant feedback before the final version was distributed.

Statistical Analysis

Data collected from the questionnaires were entered into an Excel sheet and analyzed using SPSS (Statistical Package for the Social Sciences) software, version 26. Descriptive statistics were used to summarize categorical data in terms of frequencies and percentages. For Non-normally distributed data,the median and interquartile range (IQR) were used for description. The Mann-Whitney and Kruskal-Wallis tests were used to assess associations between knowledge scores and demographic factors or medical history. A significance level of $p < 0.05$ was considered statistically significant.

The scoring system for knowledge and practice responses was structured as follows: correct answers were assigned a score of 1, while incorrect answers received a score of 0. The total score for each section was determined by summing the individual question scores within that section.

Results

A total of 380 women, aged 18 years and older, who were using combined oral contraceptive pills (COCPs), were included in the study. The majority of participants were from Taif City, Saudi Arabia (n = 194, 51.1%). The sample was predominantly married (n = 332, 87.4%), and a large proportion had obtained a university degree (n = 258, 67.9%). Additional demographic details are presented in Table 1.

Table 1: Sociodemographic variables of the included participants (N=380)

Variable	Category	Number	Percentage
Age (years)	18-30	125	32.9
	31-40	131	34.5
	>40	124	32.6
Residential city	Taif	194	51.1
	Jeddah	102	26.8
	Makkah	82	21.6
	Madinah	2	0.5
Marital status	Married	332	87.4
	Unmarried	48	12.6
Educational level	High school and below	90	23.7
	University	258	67.9
	Postgraduate	32	8.4

Table 2 presents the medical history of the participants. The largest proportion, 119 women (31.3%), reported using combined oral contraceptive pills (COCPs) for more than two years. The majority, 295 women (77.6%), used the pills primarily for pregnancy prevention. About one-third of participants, 122 women (32.1%), experienced side effects or complications while using COCPs. The most commonly reported side effects were mental health issues, including anxiety, nervousness, depression, and mood swings (8.8%), as well as headache or migraine (5.3%). Despite these side effects, only two women (0.5%) were diagnosed with deep vein thrombosis (DVT) while using the contraceptive pills, as shown in Figure 1.

Table 2: Medical history of the included participants (N=380)

Variable	Category	Number	Percentage
Duration of using the birth control pills	Less than six months	98	25.8
	Six months to one year	93	24.5

	One to two years	70	18.4
	More than two years	119	31.3
Reason for start using birth control pills	To prevent pregnancy	295	77.6
	Regulating the menstrual cycle	66	17.4
	Hormonal replacement therapy	19	5
Have you ever experienced any side effects or complications associated with using combined birth control pills?	Yes	122	32.1
	No	258	67.9
Do you have any existing medical conditions that may increase your risk of DVT?	Yes	45	11.8
	No	186	48.9
	I don't know	149	39.2
How many times do you do physical activity per week?	Always	83	21.8
	Sometimes	162	42.6
	Rarely	94	24.7
	Never	41	10.8
Do you have a family history of deep vein thrombosis or other blood clotting disorders?	Yes	101	26.6
	No	279	73.4

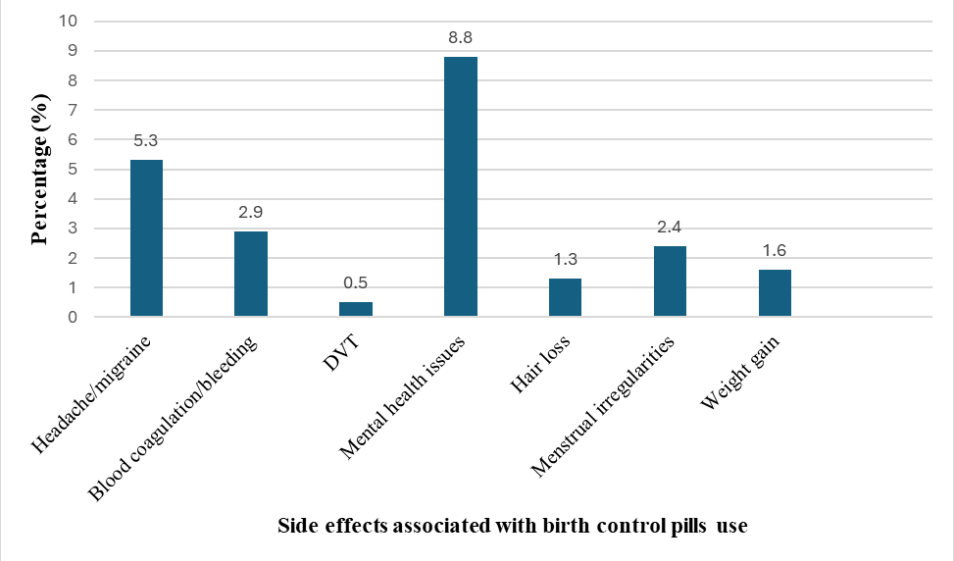

Figure 1: Side effects or complications associated with the use of birth control pills in the participating women

Table 3 presents the participants' knowledge and practices regarding the risk of deep vein thrombosis (DVT) among women using combined oral contraceptive pills (COCPs). Half of the participants (n = 192, 50.5%) had heard of DVT and were aware of the association between the use of birth control pills and the risk of DVT (n = 209, 55%). The majority of participants (56.3%) primarily relied on the internet for information about the potential risks and benefits of oral contraceptive medications, as shown in Figure 2. However, 239 women (62.9%) were unaware of preventive measures to reduce these risks. The median (IQR) knowledge score was 2 (2) out of 4 points, while the median (IQR) practice score was 1 (1) out of 2 points.

Table 3: Knowledge and practice about DVT among women using oral contraceptive pills (N=380)

Items	Answer	Number	Percentage
Knowledge			
1-Have you heard about deep venous thrombosis (DVT)?	Yes	192	50.5
	No	188	49.5
2-Did you know that using birth control pills is associated with an increased risk of deep vein thrombosis?	Yes	209	55
	No	171	45
3-Are you aware of any preventive measures to reduce the risk of DVT while using contraceptives?	Yes	141	37.1
	No	239	62.9
4-How satisfied are you with the level of awareness regarding the risk of DVT?	Satisfied	152	40
	Neutral	95	25
	Not satisfied	133	35
Practice			
1-Do you think that the risk of venous thrombosis with the use of contraceptives may affect the way you choose a method of pregnancy?	Yes	299	78.7
	No	81	21.3
2-How often do you discuss with your healthcare provider about the potential risk of DVT when considering or using oral contraceptives?	Always	48	12.6
	Sometimes	101	26.6
	Rarely	97	25.5
	Never	134	35.3

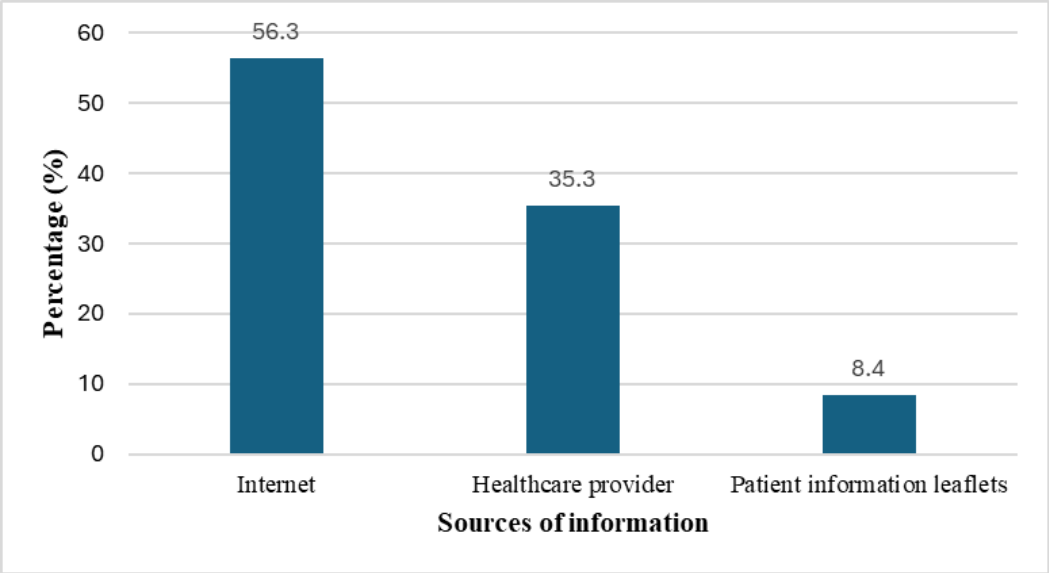

Figure 2: Sources of information about the potential risks and benefits of oral contraceptive medications

Additionally, Table 4 presents the factors that may affect the included women's median knowledge score on the potential risk of DVT. The results found no significant association between age, marital status, educational level, duration, and reason for taking contraceptive pills and the participants' median knowledge score. However, there is a significant (P=0.017) higher median knowledge score in Makkah City (3) compared to Taif (1), Jeddah (2), and Madinah (2).

Table 4: Factors affecting the median knowledge score of the included women

Factor	Median knowledge score Median (IQR)	P value
Age (years) 18-30 31-40 >40	 2 (2) 2 (2) 2 (3)	0.37
Residential city Taif Jeddah Makkah Madinah	 1 (3) 2 (2) 3 (2) 2 (0)	0.017
Marital status Married Unmarried	 2 (2) 2 (3)	0.588
Educational level High school & below University Postgraduate	 2 (2) 2 (3) 2 (2)	0.622
Duration of taking birth control Less than six months Six months and more	 1.5 (2) 2 (2)	0.980
Reason for taking birth control To prevent pregnancy Regulate menstrual cycle Hormonal replacement therapy	 2 (2) 2 (3) 2 (2)	0.555

Discussion

The findings of this study reveal a moderate level of knowledge regarding combined oral contraceptive pills (COCPs) and their associated risks of deep vein thrombosis (DVT) among women in Western Saudi Arabia. This aligns with prior research, who observed limited awareness of COCP risks, including venous thromboembolism (VTE), among young women in Riyadh [7]. Similarly, Alhusain identified significant gaps in contraceptive knowledge across women of reproductive age, emphasizing the need for broader educational efforts [8].

A notable portion of participants (62.9%) were unaware of preventive measures to mitigate DVT risk, underlining the necessity for targeted educational initiatives. Studies have stressed the importance of increasing awareness and counseling regarding thromboembolic risks, particularly for women with additional risk factors [9]. Furthermore, research on the differential risks posed by various COCP formulations, as discussed by Stegeman et al., highlights the variability in DVT.

Risks depending on the type of progestogen and estrogen dosage, supporting the need for tailored counseling during COCP prescription [2]. Similarly, Vinogradova found significant variations.

In DVT risk across hormonal formulations and emphasized the importance of evaluating individual risk factors when prescribing COCPs [12].

Interestingly, over half of the participants (56.3%) reported relying on the internet as their primary source of information about COCPs rather than consulting healthcare providers. This trend aligns with findings in other studies, which caution against the fragmented and potentially misleading nature of online information. Increased involvement of healthcare providers in patient education could address this gap and promote evidence-based decision-making [7,8,2].

Despite high levels of awareness regarding the potential risks of DVT (55%), preventive discussions with healthcare providers were reported by only 12.6% of participants. This reinforces the conclusions of Malhotra et al., who advocate for structured, routine counseling to ensure comprehensive understanding of COCP-associated risks and preventive measures[10].

Additionally, findings from Sharma suggest that awareness alone may not translate into behavioral changes; hence, systematic educational programs are essential [9,2,12]. Structured counseling on hormonal contraception has been shown to improve patient understanding and mitigate risks of venous thromboembolism, as highlighted in prior studies [11].

Demographic factors, such as age, marital status, or education level, did not significantly influence participants' knowledge of DVT risks. However, higher knowledge scores observed among women in Makkah suggest that regional initiatives or healthcare access disparities may play a role, warranting further exploration to standardize educational efforts nationwide [7,8].

This study also supports global findings that COCP use increases the relative risk of DVT two to six times compared to non-users, with risks varying by specific hormonal compositions. Research indicates that third-generation progestogens, such as desogestrel, carry higher risks compared to second-generation options, reinforcing the importance of tailored contraceptive advice [2,12,14].

Moreover, Martinelli highlighted the role of inherited thrombophilia as a contributing factor to DVT risk among COCP users, suggesting that genetic screening may help identify at-risk individuals [13,16].

Kemmeren et al. further underscored that third-generation oral contraceptives significantly elevate DVT risk compared to second-generation options, emphasizing the need for careful contraceptive selection based on individual risk profiles [14].

Heit et al. demonstrated that early recognition of DVT signs and consistent follow-up can prevent complications, particularly in women with predisposing factors [15] Additionally, Bates et al. emphasized the importance of preventive measures and clinical guidelines to mitigate the risk of venous thromboembolism in COCP users [17].

In conclusion, this study underscores the need for improved awareness and preventive measures regarding DVT among COCP users in Saudi Arabia. To enhance the safety and efficacy of COCP use, it is crucial to increase healthcare provider involvement and implement structured educational programs focused on VTE and DVT risks. These interventions could significantly improve women's understanding of the risks associated with COCPs and promote more informed decision-making, ultimately leading to better health outcomes.

Limitations

This study has several limitations. First, its cross-sectional design limits the ability to establish causal relationships between contraceptive use and knowledge of DVT risk. Additionally, the reliance on self-reported data may introduce recall and social desirability biases, potentially overestimating participants' knowledge and practices. The study's sample, drawn from women in the Western region of Saudi Arabia, may not be representative of women in other regions or those not using COCPs, limiting the generalizability of the findings. Future studies could address these limitations by incorporating longitudinal designs, objective knowledge assessments, and a broader, more diverse sample.

Declarations

Ethical Approval

The study was conducted from February 2024 to November 2024, with ethical approval granted by Taif University (Approval No: HAO-02-T-105).

Consent to Publication

Not Applicable

Availability of Data and Material

Available on corresponding author upon responsible request.

Competing Interests

No competing interests related to this article.

Funding Statement

None

Acknowledgments

None

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