



GRADUATION PROJECT

Degree in Dentistry

KNOWLEDGE OF ANTITHROMBOTIC DRUGS IN THE LAST YEAR OF DENTISTRY AND MEDICAL SCHOOL. IS THERE A GAP?

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RESUMEN

Introducción: La creciente prevalencia de enfermedades cardiovasculares ha incrementado el uso de medicamentos antitrombóticos. Ante esta realidad, es esencial que estudiantes de Medicina y Odontología estén bien formados en farmacología y manejo clínico de estos fármacos. **Objetivo:** Evaluar el conocimiento sobre medicamentos antitrombóticos en estudiantes de último año de Medicina y Odontología. ¿Existe una brecha? **Métodos:** Se llevó a cabo un estudio transversal mediante una encuesta a 103 estudiantes de último año de la Universidad Europea de Madrid (24 de Medicina y 79 de Odontología). El cuestionario consistió en 16 preguntas: 5 sin respuesta correcta y 11 con respuesta correcta. **Resultados:** La puntuación media fue de 7,89 sobre 16, con un rendimiento ligeramente superior en los estudiantes de Medicina (media = 8,33) frente a Odontología (media = 7,76), aunque sin significancia estadística ($p = 0,20$). En cuanto a la confianza, los estudiantes de Medicina mostraron niveles más altos (11 de 23 se declararon muy confiados) frente a los de Odontología (43 de 79 algo confiados), diferencia que sí fue significativa ($p = 0,004$). El reconocimiento del dabigatrán fue mayor entre los de Medicina (21 de 24) que entre los de Odontología (52 de 79), con diferencia significativa ($p = 0,041$). **Conclusión:** Aunque ambos grupos mostraron conocimientos aceptables, los estudiantes de Medicina obtuvieron resultados ligeramente mejores. Las carencias detectadas en Odontología evidencian la necesidad de fortalecer la formación interdisciplinaria, especialmente en anticoagulantes orales nuevos como el dabigatrán.

Palabras clave: Odontología, Antitrombóticos, Coagulación, Anticoagulantes, Antiagregantes plaquetarios, Insuficiencia cardíaca, Cardiovascular

ABSTRACT

Introduction: The growing prevalence of cardiovascular diseases has resulted in increased use of antithrombotic medications. As healthcare providers—both in medicine and dentistry—encounter more patients using these drugs, it's essential that students from both disciplines are well-educated in their pharmacological profiles and clinical management. **Objective:** To evaluate the knowledge of antithrombotic drugs among final-year medical and dental students and determine if there is a knowledge gap. **Methods:** A cross-sectional survey was conducted at the European University of Madrid, involving 103 final-year students—24 from Medicine and 79 from Dentistry. The questionnaire consisted of 16 questions, 5 without correct answers and 11 with definitive correct answers. **Results:** The overall mean score was 7.89 out of 16. Medical students scored slightly higher (mean = 8.33) than dental students (mean = 7.76), although this difference was not statistically significant ($p = 0.20$). Confidence levels differed significantly ($p = 0.004$), with 11 of 23 medical students reporting high confidence compared to 43 of 79 dental students reporting only moderate confidence. Recognition of newer antithrombotic agents, such as dabigatran, was significantly better among medical students (21 of 24 correct) than dental students (52 of 79 correct), with a p -value of 0.041. **Conclusion:** While both groups showed a generally acceptable understanding, medical students performed slightly better. Gaps in knowledge among dental students, particularly regarding newer oral anticoagulants like dabigatran, indicate the need for strengthened interdisciplinary education in this area.

Key words: Dentistry, Antithrombotic, Coagulation, Anticoagulants, Antiplatelet, heart failure, cardiovascular

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1. INTRODUCTION

The use of antithrombotic drugs particularly anticoagulants and antiplatelet agents has become a cornerstone in the prevention and management of cardiovascular and thromboembolic diseases such as atrial fibrillation, deep vein thrombosis, and ischemic stroke. As the global burden of these conditions continues to rise, healthcare professionals including future doctors and dentists must be equipped with a solid understanding of these medications and their clinical implications(1).

In both medicine and dentistry, managing patients on antithrombotic therapy presents a unique set of challenges. These range from controlling bleeding during routine procedures to making informed decisions about drug continuation or termination before surgery (2). The shift from traditional vitamin K antagonists like warfarin to direct oral anticoagulants such as dabigatran and rivaroxaban has further increased the complexity, with many students and even clinicians lacking sufficient familiarity with these newer drugs.

Evidence shows that inadequate knowledge about these medications may lead to inappropriate alterations in therapy either unnecessary discontinuation or failure to manage bleeding risk both of which can result in severe complications (3). In particular, studies highlight significant gaps in knowledge among dental professionals regarding the use of Direct oral anticoagulants, and many dentists report uncertainty when handling patients who are prescribed these drugs(4). Alarming, this uncertainty extends to basic concepts like the interpretation of INR values in patients on warfarin(4).

Despite growing awareness, curriculum coverage of antithrombotic therapy in medical and dental education remains inconsistent across institutions. Students often report learning about these drugs primarily through lectures, with limited clinical exposure or interdisciplinary training(5). Given that a substantial number of dental patients are on long-term antithrombotic therapy, this knowledge gap can hinder the safe delivery of care and lead to increased reliance on medical referrals or inappropriate treatment delays (5).

The hemostatic process of blood clotting strikes a balance between the risk of thrombosis (excessive clotting) and bleeding. Clotting is triggered as soon as a blood vessel is damaged in order to close the wound and stop more bleeding. A fibrin clot forms at the site of injury as a result of this cascade mechanism(6)

It entails the intricate synchronization of four elements: fibrinolysis, platelet aggregation, coagulation factor activation, and vascular endothelium(7).

Abnormal clotting risks are common in patients with cardiovascular problems(8). In patients with cardiovascular conditions such as atrial fibrillation, Atherosclerosis malignancy, or genetic illnesses like Factor V Leiden are more likely to have unintended clot formation(7). Furthermore, diseases including critical illness and chronic kidney disease can cause mixed hemostatic problems, which present hazards of clotting and bleeding that need to be carefully managed(9)

Recent research emphasizes the growing presence of patients on chronic antithrombotic therapy within dental settings, making it essential for dentists to understand both the pharmacological and clinical implications of these medications(10,11). Treatments such as tooth extractions can often be safely performed without interrupting antithrombotic therapy when appropriate local hemostatic techniques are applied(10). These findings support the growing movement against the routine withdrawal of antithrombotic drugs before dental procedures, a topic that remains debated in clinical guidelines and academic circles(11,12).

Unfortunately, several studies reveal knowledge gaps among dental students and practicing dentists regarding the management of patients on direct oral anticoagulants such as dabigatran, rivaroxaban, and apixaban(13,14). In addition direct oral anticoagulants were introduced only 10 years ago, tend to be less familiar to students compared to old drugs like warfarin(15). Patients undergoing dental and maxillofacial surgeries often use these drugs, making education in this area a priority.

Improving student knowledge and confidence in handling antithrombotic drugs also depends on communication and interdisciplinary collaboration. Dental professionals are increasingly expected to coordinate care with physicians, manage bleeding risks, and adapt treatment plans. These roles require correct pathophysiologic knowledge (7,8,12).

1.1. Classification of Antithrombotic Drugs

Anticoagulants, antiplatelet agents, and fibrinolytics are considered antithrombotic drugs that affect the development or maintenance of blood clots. Anticoagulants decrease the creation of

fibrin, antiplatelets stop the generation of platelet plugs, and hospital-use fibrinolytics dissolve fibrin (Figure 1) clots during heart attacks and strokes. Understanding the effects of anticoagulants and antiplatelets is crucial because in dentistry, even though fibrinolytics are typically irrelevant to dental practice(8)

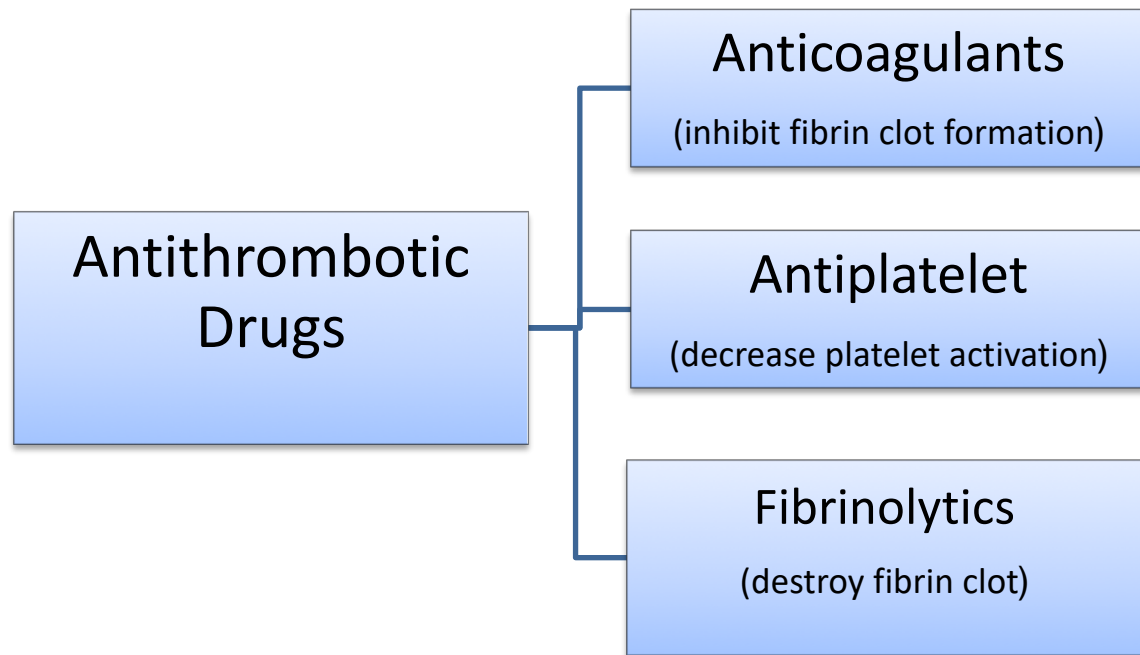


Figure 1. The three types of antithrombotic drugs and their function

1.2. Mechanisms of actions of antithrombotic drugs

In the recent years there have been a lot of improvements and advancement regarding drugs used in controlling patients with Cardiovascular diseases, ischemic heart disease and stroke which are the primary cause of death worldwide and a significant factor in disability. Antithrombotic drugs are usually divided into three subgroups, anticoagulants, antiplatelet and fibrinolytics.

1. Antiplatelet drugs: they inhibit platelet function and effect and also helps to decrease thrombus formation. The main example of these drugs is aspirin which acts as a inhibitor agent for cyclooxygenase also known as COX-1 in platelets and blocks thromboxane A2 synthesis, that decreases platelet aggregation(7,16)
2. Anticoagulants: these drugs inhibit coagulation cascade and block clot formation. Anticoagulants drugs include:

- I. vitamin K antagonists such as warfarin and Acenocumaro[that inhibits the synthesis of vitamin k that activate of clotting factors such as II,VII,IX,x
 - II. direct oral anticoagulants, including the thrombin inhibitors such as dabigatran and the Xa inhibitors such as rivaroxaban and apixaban(10,15)
3. And Fibrinolytics that are mainly used in emergency situation in hospitals(7,10).

1.3. Clinical indications and use of antithrombotic drugs.

Adults worldwide are thought to have cardiovascular disease, which includes atherosclerosis, acute coronary syndrome, coronary artery disease, peripheral arterial disease, ischemic cerebrovascular accidents, and transient ischemic attacks are examples of these disorders. The primary type of pharmacologic treatment for these atherothrombotic disorders are oral antiplatelet medications, which interfere with normal platelet activity to assist stop the course of the disease and its associated consequences. In general, every on the market today targets platelet aggregation or activation.(7)

The dynamic character of cardiovascular pharmacology is shown by this continuous change in therapeutic approaches, which is fueled by new research and clinical studies(17). Antithrombotic drugs, including antiplatelet and anticoagulant agents, are widely used for preventing and managing cardiovascular diseases like atherosclerosis, atrial fibrillation, and thromboembolic disorders. These medications have significant clinical implications in both medicine and dentistry and also Antiplatelet agents such as aspirin and clopidogrel, widely used for preventing myocardial infarctions and strokes, similarly require minimal adjustments for dental procedures(11)

Recent developments is also to maximize the balance between safety and effectiveness, specifically lowering the risk of bleeding while preserving the antithrombotic effects. For instance, in contrast to conventional vitamin K antagonists like warfarin, direct oral anticoagulants like apixaban and rivaroxaban have predictable pharmacokinetics and eliminate the need for routine INR monitoring. Because of their safety record in handling common dental treatments without necessitating the cessation of therapy, they have become more and more well-liked(12).

In dentistry, cautious preparation is necessary to minimize bleeding issues when managing patients on antithrombotic treatment. Studies show that, as long as local hemostatic treatments

like gauze compression or fibrin sealants are used, teeth extractions and small surgeries can usually go forward without stopping these medications. A multidisciplinary strategy comprising medical consultation or referral to specialized care facilities may be required for high-risk patients like those with coagulopathies or chronic illnesses(10,12)

Key words: Dentistry, Antithrombotic, Coagulation, Anticoagulants, Antiplatelet, heart failure, cardiovascular

2. OBJECTIVE

The purpose of this study is to evaluate final-year medical and dental students' knowledge of antithrombotic drugs.

3. MATERIAL AND METHODS

- Study design: A cross-sectional survey was used to assess final-year medical and dental students' knowledge of antithrombotic medications. Their comprehension of pharmacological classifications, mechanisms of action, clinical applications, and patient management issues was evaluated using a standardized questionnaire. The study was reviewed and validated by the investigation committee of the European University of Madrid with code of OD.023/2425
- Sampling: Final-year students from Universidad Europea de Madrid participated in the study.
- Data collection: An online survey consist of 16 question was distributed via student media and social platforms to evaluate theoretical knowledge

4. RESULTS

4.1. Overall knowledge comparison between medical and dental students

In total, 103 students participated, 79 from dentistry and 24 from medicine.

On average, students got about 7.89 questions right out of 16 with a standard deviation of 1.91.

When we looked at the two groups separately (Figure 2):

- Medical students had an average score of 8.33 with a standard deviation of 2.01
- Dentistry students scored slightly lower, with an average of 7.76 and a standard deviation of 1.87

Even though the medicine students scored a bit higher, when we ran a t-test, the difference wasn't actually significant ($P = 0.20$).

Basically, this means that both groups did about the same overall. It was interesting to see that, even though we as dentistry students don't go into as much depth on systemic meds as med students do, our knowledge on this topic still holds up pretty well.

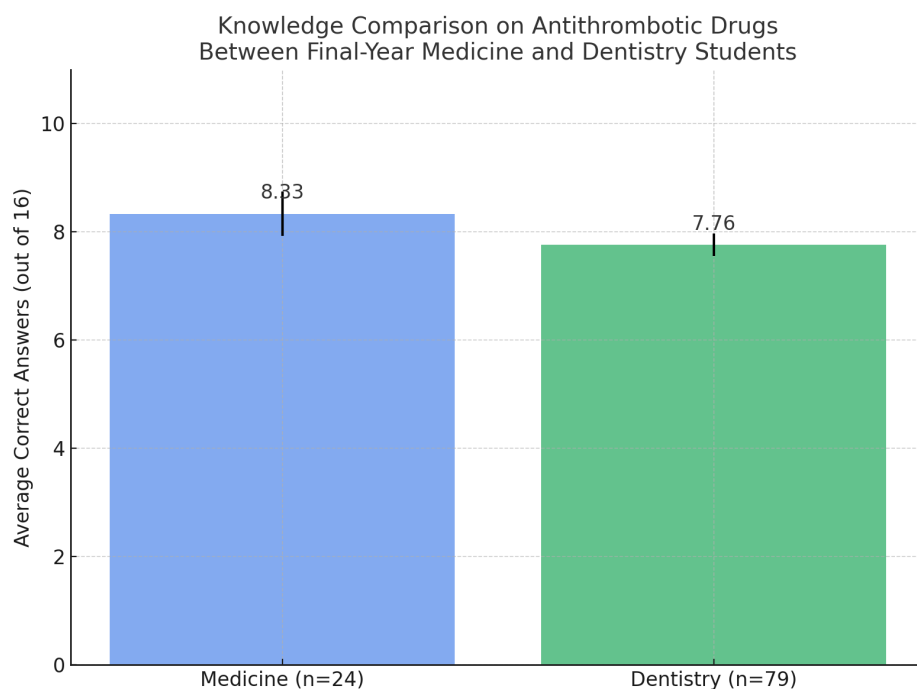


Figure 2. Average number of correct answers on antithrombotic drug knowledge among final-year students. Medical students scored slightly higher (mean = 8.33) than dentistry students (mean = 7.76), but the difference was not statistically significant ($P = 0.20$).

Table 1. Survey responses from final-year medicine and dentistry students regarding demographic background and how often they believe they will treat patients on antithrombotic medication

	Medicine	Dentistry	P value
What is your sex?			0,77
Male	50% (n = 12)	54.4% (n = 44)	
Female	50% (n = 12)	44.6% (n = 35)	
Where are you from?			0,013
Spain	50% (n = 12)	22.8% (n = 18)	
Europe (except Spain)	12.5% (n = 3)	39.2% (n = 31)	
Non-European	37.5% (n = 9)	38% (n = 30)	
How often do you think you will encounter patients on antithrombotic drugs?			0,0001
Every day	12.5% (n = 3)	6.3% (n = 5)	
Each week	83.3% (n = 20)	31.6% (n = 25)	
Each month	0% (n = 0)	43% (n = 34)	
Each Year	4.2% (n = 1)	19% (n = 15)	

We included frequency of encountering antithrombotic drugs, in both groups the results showed, medicine students encounter patients more weekly with percentage of 83,3% of students answering each week and in dentistry students they encounter more monthly with 43% of students answering each month and 31,6% of the students answering each week (Figure 3). And after conducting t test to compare the results, p value was 0,0001 that shows a significant difference between the number of patients both groups encounter.

We also found a significant difference in the knowledge about the use of antiplatelet drugs between the groups ($P = 0.004$), with more dentistry students getting this right with the percentage 39.2% of them, compared to medical students with only 8,3% of them answering it correctly, which was surprising

4.2. Classification old vs. new antithrombotic

In the next 6 question in the survey we tried to comprehend students' knowledge by asking them the type of the famous drugs (Figure 4) that are being used mostly by anticoagulated patients such as heparin which is an anticoagulant, warfarin and acenocumarol which are vitamin k antagonist, clopidogrel, prasugrel and ticagrelor which are antiplatelets, edoxaban and ribaroxaban which are direct oral anticoagulants and we also included amoxicillin as drug that

is only an antibiotic. The results after conducting p-value showed that both groups have almost a same level of understanding of drugs classification.

Table 2. Comparison of drug classification accuracy between final-year medicine and dentistry students.

Drug(s)	Medicine (%)	Dentistry (%)	P-value
Heparin	75.0%	65.8%	0.399
Warfarin, Acenocumarol	83.3%	77.2%	0.522
Clopidogrel, Prasugrel, Ticagrelor	83.3%	69.6%	0.186
Edoxaban, Rivaroxaban	87.5%	69.6%	0.081
Dabigatran	87.5%	65.8%	0.041
Amoxicillin	91.7%	98.7%	0.071

- Heparin Identification: 75% of medicine students identified heparin correctly and 65,8 % of dentistry students identified it correctly with p = 0.399
- Warfarin, Acenocumarol: 83.3% of medicine students identified heparin correctly and 77.2 % of dentistry students identified it correctly with p = 0.522
- Clopidogrel, Prasugrel, Ticagrelor Identification: 83.3% of medicine students identified heparin correctly and 69.6% of dentistry students identified it correctly with p = 0.186
- Edoxaban and Ribaroxaban Identification: 87.5% of medicine students identified heparin correctly and 69.6 % of dentistry students identified it correctly with p = 0.081
- Dabigatran Identification: 87.5% of medicine students identified heparin correctly and 65,8 % of dentistry students identified it correctly p = 0.041
- Amoxicillin Identification: 91.7% of medicine students identified heparin correctly and 98.7 % of dentistry students identified it correctly p = 0.071

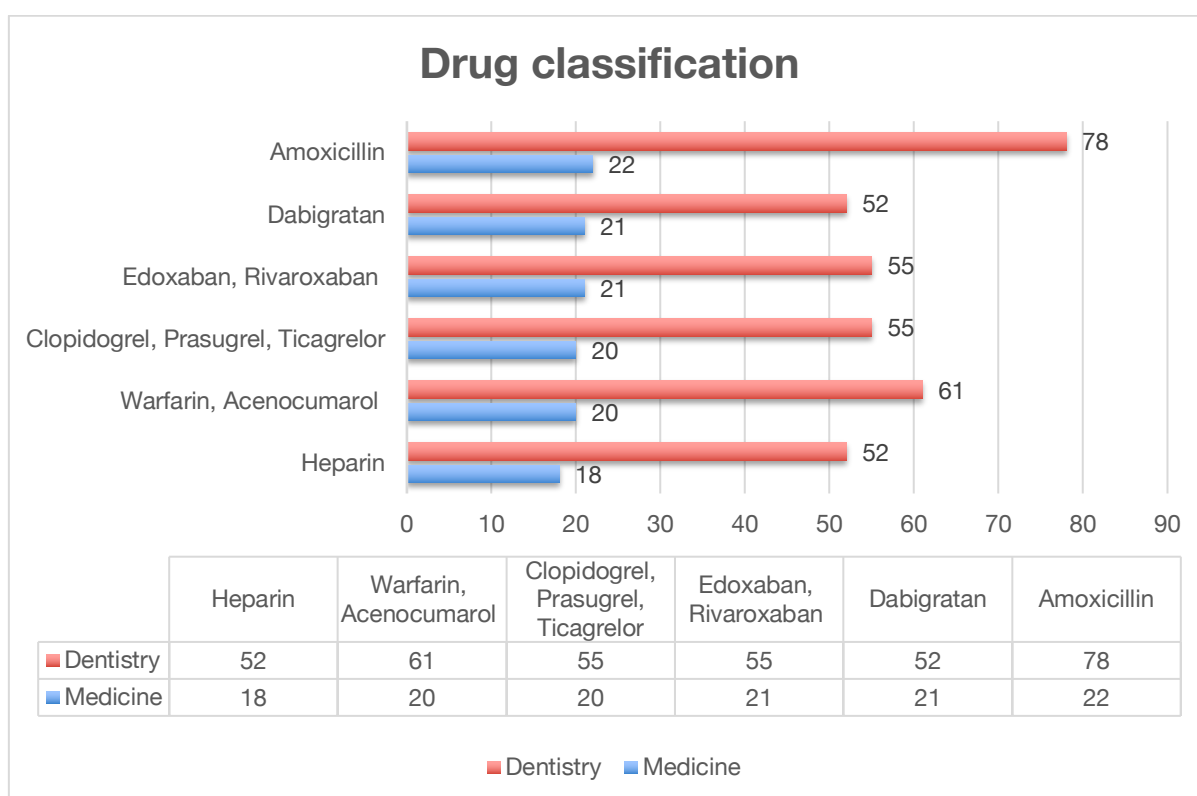


Figure 3. Comparison of drug classification accuracy between final-year medicine and dentistry students.

Table 3. Knowledge and perceptions of final-year medicine and dentistry students on the clinical use and monitoring of anticoagulant therapy

	Medicine	Dentistry	P value
In which conditions are anticoagulant drugs often necessary in elderly patients?			0,269
Stable angina	8.3% (n = 2)	17.7% (n = 14)	
Alzheimer disease	4.2% (n = 1)	2.5% (n = 2)	
Atrial fibrillation	83.3% (n = 20)	72.2% (n = 57)	
All	7.6% (n = 1)	4.2% (n = 6)	
Which is the preferred test of choice for patients taking vitamin K antagonists?			0,12
INR	95.8% (n = 22)	83.5% (n = 66)	
bleeding and clotting time	0.0%	12.3% (n = 10)	
Activated Partial Thromboplastine	4.2% (n = 1)	3.8% (n = 3)	
None	0%	0%	

How confident do you feel managing patients on antithrombotic drugs?			0,004
Very confident	45.8% (n = 11)	12.7% (n = 10)	
Somewhat confident	41.7% (n = 10)	54.4% (n = 43)	
Not very confident	8.3% (n = 2)	27.8% (n = 22)	
Not confident at all	4.2% (n = 1)	5.1% (n = 4)	
What type of drugs should patients with mechanical heart valve prosthesis receive?			0,89
vitamin K antagonists	45.8% (n = 11)	44.3% (n = 35)	
direct oral anticoagulants	37.5% (n = 9)	32.9% (n = 26)	
antiplatelet agents	16.7% (n = 4)	12.7% (n = 10)	
it depends on the type of mechanical heart valve prosthesis	0.0%	10.1% (n = 8)	
What is the most common international normalized ratio target for patients treated with vitamin K antagonists?			0,79
1	0%	3.8% (n = 3)	
2-3.5	91.7% (n = 22)	89.9% (n = 71)	
3.5-5	4.2% (n = 1)	3.8% (n = 3)	
5-7	4.2% (n = 1)	2.5% (n = 2)	

4.3. Clinical reasoning and application

The remaining questions on the survey (Figure 6) asked about the conditions when anticoagulant drugs are often necessary in elderly patients, the type of test mostly used to monitor patient taking vitamin k antagonist and the drugs that are mostly prescribed for the patient with mechanical heart valve prosthesis. In all these questions after conducting p-value, the results showed no significant differences which indicates a good understanding of both groups about these drugs in clinical applications and managements.

- Use of Anticoagulantes: p = 0.269
- Drugs prescribed for the patients with mechanical heart: p = 0.895
- Test for Vitamin K Antagonists (INR): p = 0.124

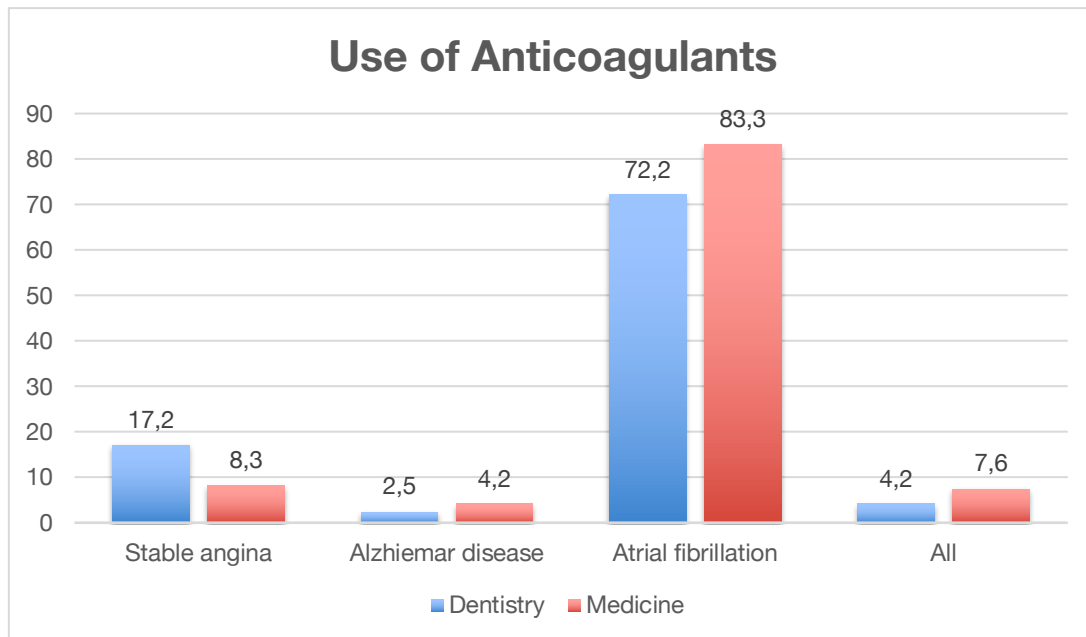


Figure 4. Responses from final-year medicine and dentistry students regarding the clinical conditions in which anticoagulant drugs are often necessary in elderly patients. While the majority of both groups correctly identified atrial fibrillation, a proportion of dentistry students selected stable angina or other options. The difference in response distribution was not statistically significant ($P = 0.269$)

And lastly the important question was about the confidence level of both groups dealing with antithrombotic drugs and clinical application and management.

- Confidence in Managing Patients on Antithrombotic Drugs: $p = 0.004$ (Significant)

The p-value shows that there is significant difference between the medicine students and the dentistry students, the medicine students generally felt more comfortable and confidence compared to dentistry students which could be due to the curriculum of medicine degree which is more focused on these drugs.

5. DISCUSSION

This study investigated the level of knowledge, drug classification ability, and confidence among final-year medical and dental students regarding the use of antithrombotic drugs. The results showed that while both groups performed similarly, medical students had a slightly higher average score, although this difference was not statistically significant. These findings reflect a general consistency with previous research evaluating the theoretical knowledge base among undergraduates (4,18).

Students displayed greater familiarity with traditional antithrombotic agents such as warfarin and heparin. However, there was a notable drop (Figure 8) in accuracy when it came to identifying newer direct oral anticoagulants, particularly dabigatran, where the difference between the two groups was statistically significant. This suggests that while current educational curricula cover old drugs reasonably well, there may be insufficient emphasis on newer therapies that are becoming increasingly relevant in clinical settings(2,19,20).

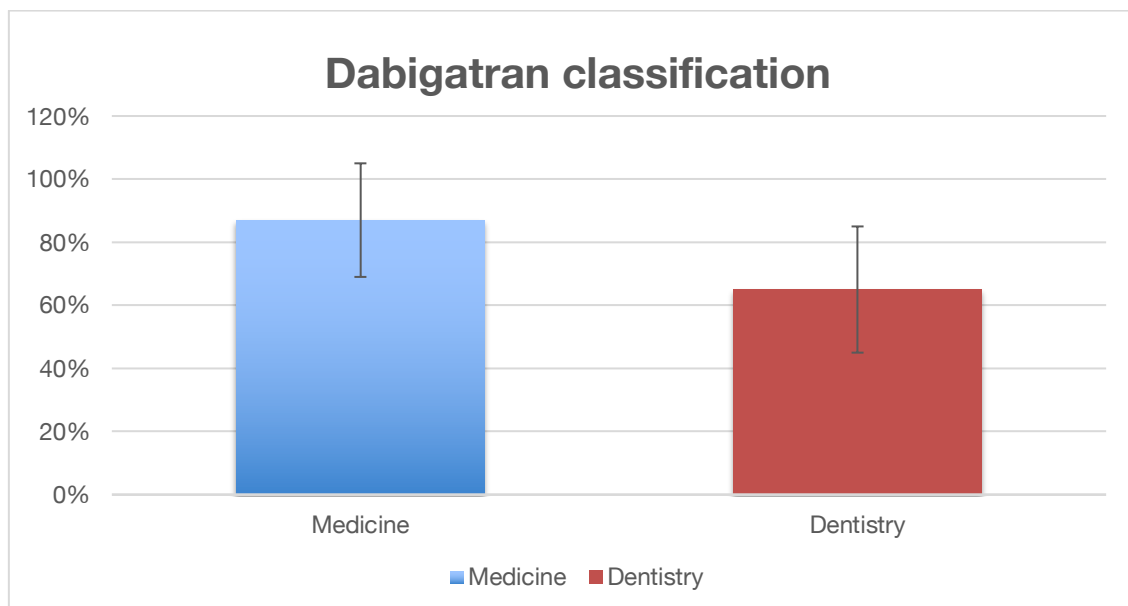


Figure 5. Percentage of final-year medicine and dentistry students who correctly classified dabigatran as a direct oral anticoagulant. Medical students demonstrated significantly higher accuracy compared to their dental counterparts ($P = 0.041$)

The ability to correctly apply clinical reasoning in context was inconsistent. Although most students recognized the importance of International Normalized Ratio INR monitoring for patients on vitamin K antagonists, a small but significant number selected inappropriate

alternatives. This inconsistency may indicate a gap between theoretical knowledge and practical application. Similarly, when asked about drug choices for patients with mechanical heart valve prostheses or elderly individuals with atrial fibrillation, students from both groups demonstrated uncertainty, reflecting incomplete understanding of clinical guidelines(21–23).

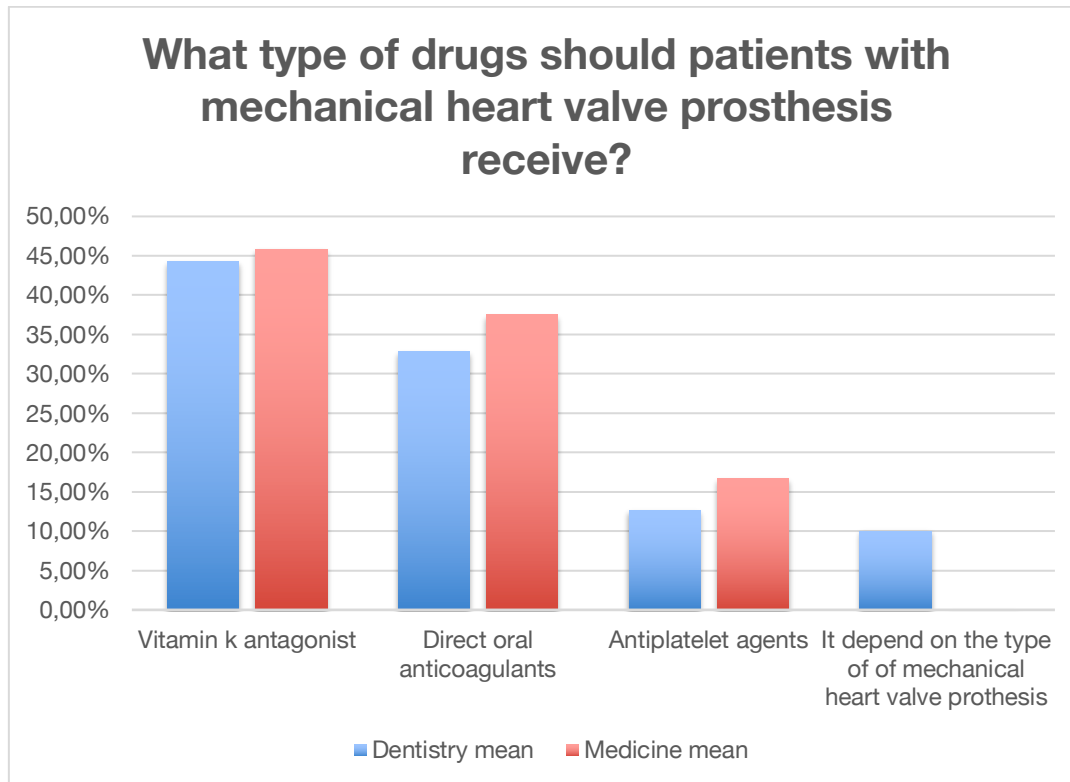


Figure 5. Responses from final-year dentistry and medicine students regarding the appropriate drug choice for patients with mechanical heart valve prostheses. Although vitamin K antagonists were correctly identified by the highest proportion of students in both groups, a substantial number selected direct oral anticoagulants or antiplatelet agents, indicating uncertainty around guideline-based management. The difference between the two groups was not statistically significant ($P = 0.895$).

Another area of concern identified was the confidence levels. Medical students expressed significantly higher confidence in managing patients on antithrombotic drugs compared to their dental counterparts. This difference is likely influenced by the greater frequency of clinical exposure reported by medical students, which was significantly higher. Dental students, in contrast, more commonly anticipated encountering these patients on a monthly basis. Limited hands-on exposure may hinder development of confidence in real-life scenarios (13,14).

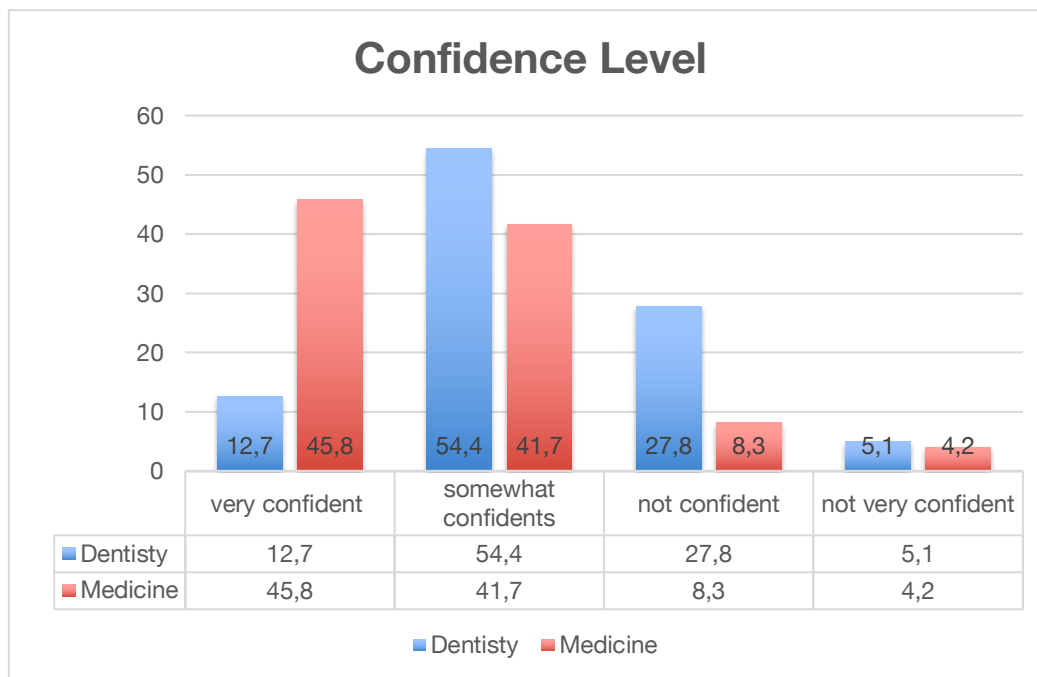


Figure 6. confidence levels in managing antithrombotic drugs among final-year students. Medical students reported significantly higher levels of confidence compared to dentistry students, with 45.8% feeling “very confident” versus 12.7% in the dentistry group. The difference between the two groups was statistically significant ($P = 0.004$).

Despite being part of a profession increasingly required to manage medically complex patients, dental students demonstrated cautious behavior and expressed lower levels of confidence. This trend has been echoed in various survey-based studies and suggests a systemic issue within dental education relating to interdisciplinary pharmacological understanding and risk management (24).

To address these issues, structured educational interventions are needed. Integrated teaching sessions involving real clinical case discussions, interprofessional simulations, and increased exposure to systemic conditions through medical-dental collaborative rotations may help bridge the confidence and knowledge gaps observed. In addition, focused updates to pharmacology courses emphasizing modern anticoagulation therapies could ensure students are better equipped to apply their knowledge in clinical practice (25)

6. CONCLUSION

This study aimed to evaluate the knowledge of antithrombotic medications among final-year medical and dental students. The findings revealed that while both groups demonstrated a comparable overall understanding, medical students slightly outperformed in general pharmacology knowledge, whereas dental students showed stronger understanding in specific areas like antiplatelet therapy. A significant difference was observed in the classification of dabigatran, with more medical students identifying it correctly ($p = 0.041$), highlighting a knowledge gap in newer anticoagulants among dental students. These results emphasize the need to enhance clinical pharmacology education, especially in areas with direct implications for patient safety. Integrating targeted teaching strategies and interdisciplinary learning may help address these disparities and improve preparedness in managing anticoagulated patients.

7. SUSTAINABILITY

This Final Degree Project explores the level of knowledge about antithrombotic drugs among final-year Dentistry and Medical students, from a sustainability perspective focused on healthcare education. On a social level, the project promotes the responsible and safe use of these medications, reducing clinical risks and improving the quality of patient care. It contributes to a more informed, ethical, and sustainable healthcare culture.

From an economic perspective, enhanced education helps prevent costly clinical errors, reduces unnecessary interventions, and optimizes the use of healthcare resources. Although the environmental impact is indirect, encouraging the rational use of medication and preventing medical complications contributes to less medical waste and reduced pressure on healthcare services. Furthermore, during the development of this project, we prioritized the use of digital documentation and avoided unnecessary printing, in line with sustainable academic practices and environmental responsibility.

This approach aligns with Sustainable Development Goal 12: Responsible Consumption and Production, by promoting efficient and conscious use of pharmaceutical and educational resources. In doing so, the project demonstrates a clear commitment to sustainability through both improved professional knowledge and environmentally responsible practices.

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9. ANNEXS

9.1. Annex 1. Questionnaire in English

I understand that this is an anonymous questionnaire about the knowledge of antithrombotic drugs to last year dentistry and medical students. I authorize the use of the data with the only purpose of UEM Final Degree Project supervised by Prof. Martínez-Sellés.

1. **Please clarify if you are in the last year of dentistry or medical school**
 - A) 5th year of Dentistry
 - B) 6th year of Medicine
2. **What is your sex?**
 - A. Male
 - B. Female
3. **Where are you from?**
 - A. Spain
 - B. Europe (except Spain)
 - C. Non-European
4. **How often do you think you will encounter patients on antithrombotic drugs?**
 - A. Every day
 - B. Each week
 - C. Each month
 - D. Each Year
5. **What is the primarily use of antiplatelets drugs?**
 - A. Deep vein thrombosis prevention
 - B. Stroke prevention in patients with atrial fibrillation
 - C. Prevention of myocardial infarction and cardiovascular events
 - D. Treatment of pulmonary embolism
6. **What type of drug is Heparin?**
 - A. Antiplatelet
 - B. Anticoagulant
 - C. Antibiotic
 - D. Fibrinolytic
7. **What type of drugs are acenocumarol and warfarin?**
 - A. Antiplatelet
 - B. Anticoagulant
 - C. Antibiotic
 - D. None
8. **What type of drugs are clopidogrel, prasugrel and ticagrelor?**
 - A. Antiplatelet
 - B. Anticoagulant
 - C. Antibiotic
 - D. None
9. **What type of drugs are edoxaban, rivaroxaban, and apixaban?**
 - A. Antiplatelet
 - B. Anticoagulant
 - C. Antibiotic

- D. None
10. **What type of drug is dabigatran?**
 - A. Antiplatelet
 - B. Anticoagulant
 - C. Antibiotic
 - D. None
11. **What type of drug is amoxicillin?**
 - A. Antiplatelet
 - B. Anticoagulant
 - C. Antibiotic
 - D. None
12. **In which conditions are anticoagulant drugs often necessary in elderly patients?**
 - A. Stable angina
 - B. Alzheimer disease
 - C. Atrial fibrillation
 - D. All
13. **Which is the preferred test of choice for patients taking vitamin K antagonists?**
 - A. INR
 - B. bleeding and clotting time
 - C. Activated Partial Thromboplastin Time
 - D. None
14. **How confident do you feel managing patients on antithrombotic drugs?**
 - A. Very confident
 - B. Somewhat confident
 - C. Not very confident
 - D. Not confident at all
15. **What type of drugs should patients with mechanical heart valve prosthesis receive?**
 - A) vitamin K antagonists
 - B) direct oral anticoagulants
 - C) antiplatelet agents
 - D) it depends on the type of mechanical heart valve prosthesis
16. **What is the most common international normalized ratio target for patients treated with vitamin K antagonists?**
 - A) 1
 - B) 2-3.5
 - C) 3.5-5
 - D) 5-7

9.2. Annex 2. Questionnaire in Spanish

Entiendo que se trata de un cuestionario anónimo sobre el conocimiento de los fármacos ~~antitrombóticos~~ realizado a estudiantes de último curso de odontología y medicina. Autorizo el uso de los datos con la única finalidad del Trabajo de Fin de Grado de la UEM dirigido por el Prof. Martínez-Sellés.

1. Por favor, elija si está en el último año de odontología o medicina.

- A) 5º año de Odontología
- B) 6º año de Medicina

2. ¿Cuál es su sexo?

- A) Masculino
- B) Femenino

3. ¿De dónde es usted?

- A) España
- B) Europa (excepto España)
- C) No europeo

4. ¿Con qué frecuencia cree que encontrará pacientes en tratamiento con medicamentos ~~antitrombóticos~~?

- A) Todos los días
- B) Cada semana
- C) Cada mes
- D) Cada año

5. ¿Cuál es el uso principal de los medicamentos ~~antitrombóticos~~ antiplaquetarios?

- A) Prevención de trombosis venosa profunda
- B) Prevención de ictus en pacientes con fibrilación auricular
- C) Prevención de infarto de miocardio y eventos cardiovasculares
- D) Tratamiento de embolia pulmonar

6. ¿Qué tipo de medicamento es la heparina?

- A) ~~Antiplaquetario~~
- B) Anticoagulante
- C) Antibiótico
- D) Fibrinolítico

7. ¿Qué tipo de medicamentos son el ~~aspirina~~ y la warfarina?

- A) ~~Antiplaquetario~~
- B) Anticoagulante

C) Antibiótico

D) Ninguno

8. ¿Qué tipo de medicamentos son el clopidogrel, el prasugrel y el ticagrelor?

- A) ~~Antiplaquetario~~
- B) Anticoagulante
- C) Antibiótico
- D) Ninguno

9. ¿Qué tipo de medicamentos son el edoxabán, el rivaroxabán y el apixabán?

- A) ~~Antiplaquetario~~
- B) Anticoagulante
- C) Antibiótico
- D) Ninguno

10. ¿Qué tipo de medicamento es el dabigatrán?

- A) ~~Antiplaquetario~~
- B) Anticoagulante
- C) Antibiótico
- D) Ninguno

11. ¿Qué tipo de medicamento es la amoxicilina?

- A) ~~Antiplaquetario~~
- B) Anticoagulante
- C) Antibiótico
- D) Ninguno

12. ¿En qué condiciones suelen ser necesarios los medicamentos anticoagulantes en pacientes mayores?

- A) Angina estable
- B) Enfermedad de Alzheimer
- C) Fibrilación auricular
- D) Todas

13. ¿Cuál es la prueba de elección preferida para pacientes que toman antagonistas de la vitamina K?

- A) INR
- B) Tiempo de sangrado y coagulación
- C) Tromboplastina parcial activada
- D) Ninguno

14. ¿Cómo de seguro se siente manejando pacientes en tratamiento con medicamentos ~~antitrombóticos~~?

- A) Muy seguro
- B) Algo seguro
- C) No muy seguro
- D) Nada seguro

15. ¿Qué tipo de medicamentos deben recibir los pacientes con prótesis de válvula cardíaca mecánica?

- A) Antagonistas de la vitamina K
- B) Anticoagulantes orales directos
- C) Agentes ~~antiplaquetarios~~
- D) Depende del tipo de prótesis

Heading 2 ica

16. ¿Cuál es el objetivo más común del índice internacional normalizado (INR) para pacientes tratados con antagonistas de la vitamina K?

- A) 1
- B) 2-3.5
- C) 3.5-5
- D) 5-7

9.3. Written Informed consent delivered in Spanish

Esta investigación se realiza en el marco del proyecto de graduación: (Conocimiento de los Fármacos Antitrombóticos en el Último Año de la Carrera de Odontología y Medicina. ¿Existe una Brecha?), bajo la dirección de la Prof. MANUEL MARTINEZ SELLERS. El objetivo de este estudio es evaluar el conocimiento y la concienciación de los estudiantes del último año de medicina y odontología sobre los fármacos antitrombóticos|

Su participación en este estudio es completamente voluntaria. Usted es libre de retirarse del estudio en cualquier momento, sin necesidad de dar explicaciones ni de sufrir consecuencia alguna. Los datos recogidos serán tratados con la máxima confidencialidad y se utilizarán únicamente para fines académicos y de difusión científica relacionados con esta investigación. La información recopilada será completamente anónima y no se solicitarán datos personales o identificables. El tratamiento de la información obtenida se realizará conforme a lo establecido en la Ley Orgánica 3/2018, de 5 de diciembre, de Protección de Datos Personales y Garantía de los Derechos Digitales.

Usted declara estar informado/a y otorga su consentimiento expreso para el uso de la información proporcionada en la encuesta, conforme a lo establecido en la Ley Orgánica 3/2018, de 5 de diciembre. Este consentimiento se otorga sin perjuicio de los derechos que le amparan según dicha normativa, incluyendo el derecho de acceso, rectificación, cancelación y oposición de los datos en cualquier momento. Para ejercer estos derechos, puede contactar con la profesora MANUEL MARTINEZ SELLERS al correo electrónico (MANUEL.MARTINEZSELLERS@universidadeuropea.es).