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# Impact of a comprehensive academic support and mentoring program on underperforming medical students: evidence from a 14-year institutional retrospective study

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**Introduction:** Academic underperformance among university students is a critical issue in higher education, particularly in demanding fields such as medicine. Medical students face high cognitive and emotional demands, making them vulnerable to academic failure. In response to this challenge, the Universidad Francisco de Vitoria (UFV) implemented the Comprehensive Academic Support and Mentoring Program (CASMP) to improve student outcomes.

**Objective:** This study aimed to evaluate the impact of CASMP on the academic performance of medical students at UFV. Specifically, it assessed whether structured academic support contributed to reducing the rate of insufficient academic performance (IAP) and increasing recovery among students at risk of dismissal.

**Methods:** A retrospective observational design was used to analyze academic records from 7,861 students enrolled between the 2010–2011 and 2023–2024 academic years. Students were classified as IAP if they failed to meet the minimum credit requirements defined by institutional regulations. The analysis compared academic outcomes between two periods: pre-CASMP (2010–2011 to 2014–2015) and post-CASMP (2015–2016 to 2023–2024), using chi-square and Mann-Whitney U tests.

**Results:** The results showed a significant reduction in the IAP rate following the implementation of CASMP, dropping from 12% to 7%. The percentage of students meeting academic progression standards increased from 88% to 93%. Among students at risk of dismissal, 54% recovered in the following year, with recovery rates exceeding 70% in some cohorts. Although no statistically significant difference was found in dismissal rates, a downward trend was observed over time.

**Conclusion:** In conclusion, the CASMP program has proven effective in improving academic performance and retention among medical students. Structured academic support, including tutoring, mentoring, and preventive interventions, plays a vital role in helping students overcome academic challenges and avoid failure. These findings support the integration of comprehensive support programs in medical education to foster student success.

## KEYWORDS

academic support, medical education, student performance, mentoring, academic failure, IAP

## Introduction

Academic performance among university students is a topic of significant interest and concern in the field of education, as it is closely linked to future academic and professional success. Numerous studies have explored the causes and consequences of academic underperformance, as well as strategies for its prevention and improvement (Ajjawi et al., 2020; Tan and Prihadi, 2022; Artino, 2012; Aguilar Aguilar and Manzano Soto, 2018; Alonso-García et al., 2020; Camacho Lizárraga, 2018; Manzano Soto et al., 2012; Joseph et al., 2021; Tan, 2024).

Academic underperformance can be influenced by multiple factors, including fear of failure, academic procrastination, and low achievement expectations (Tan and Prihadi, 2022; Ruiz, 2022; Pérez, 2020). Additionally, students' adaptation to university life and their emotional responses to academic failure are critical aspects that affect performance (Ajjawi et al., 2019; Zacharias and Ajjawi, 2020; Pérez, 2020; Joseph et al., 2021). In this regard, academic interventions and emotional support have proven effective in helping students overcome these challenges and improve their academic outcomes (Ajjawi et al., 2020; García, 2020). This type of support is particularly relevant in medical education, where students face high academic demands, emotional pressure, and the need for sustained motivation, making them more vulnerable to academic and psychological difficulties (Dore et al., 2020; Muñoz Comonfort and Fortoul, 2022).

In this study, academic underperformance is defined as the failure to meet the minimum credit requirements established by the academic progression regulations of Universidad Francisco de Vitoria (UFV). Given the high entry grades of medical students at UFV, it was initially assumed that their academic performance would be consistently strong. As a result, during the first 4 years of the undergraduate medical program (2010/11–2014/15), students' academic results were not formally reviewed, nor were they provided with academic guidance. However, at the end of the 2014–2015 academic year, a performance review revealed that between 10% and 14% of students were not meeting the academic progression standards, with a rising trend in the number of students classified as having insufficient academic performance (IAP). In response to this issue, UFV implemented the Comprehensive Academic Support and Mentoring Program (CASMP) with the aim of improving the academic performance of medical students (Aguilar Aguilar and Manzano Soto, 2018; Alonso-García et al., 2020; Camacho Lizárraga, 2018; Manzano Soto et al., 2012; Valenzuela et al., 2021; Delgado Saeteros et al., 2024; Daza Corredor et al., 2022). CASMP was designed to provide academic guidance and support to students experiencing performance difficulties, with the goal of preventing academic failure and promoting student success. The program includes both corrective and preventive strategies, such as group and individual tutoring sessions, academic performance prevention workshops, and peer mentoring initiatives. The implementation of these strategies is supported by research highlighting the importance of intensive academic interventions in improving student outcomes (Vaughn et al., 2012; Carbonari et al., 2024; Ramos-Monsivais et al., 2024; Montenegro Mora et al., 2020).

In the UFV undergraduate medical program, students are subject to academic progression regulations that determine their

eligibility to continue in the faculty (Universidad de Navarra, 2025; Ministerio de Ciencias Innovación y Facultades). Specifically, students who fail to meet the minimum performance criteria for two consecutive academic years face dismissal from the program. These criteria are based on the percentage of credits successfully passed each year. From the 2010–2011 to the 2014–2015 academic years, students were required to pass at least 70% of their enrolled credits (or 40 credits if they enrolled in more than 60 credits). Starting in 2015–2016, this threshold was adjusted to 60%. Consequently, students who end an academic year below the required threshold are considered at risk of expulsion due to insufficient academic performance. In analyzing the profiles of students who failed to meet the required standards for two consecutive years, distinct patterns emerged that shed light on the underlying causes of academic underperformance. Among the students who failed to meet the required performance for two consecutive years, several profiles emerged: some expressed that Medicine was not their true vocation; others had not engaged meaningfully with their academic training and were dismissed after receiving guidance on alternative academic paths. A third group consisted of students who were unable to perform due to psychological conditions, ongoing medical treatments, or other serious personal circumstances. Only this last group was granted an additional academic year under specific conditions, such as a limited credit load, documented professional follow-up, and a commitment to meet the required performance standards in order to remain in the program.

This study aims to assess whether the implementation of CASMP, introduced in the 2015–2016 academic year, has contributed to a significant improvement in the academic performance of medical students at UFV. To this end, academic results from the 2010–2011 to 2023–2024 academic years are analyzed, allowing for the identification of trends, patterns, and the potential influence of academic interventions on student success (Martínez, 2016). These results correspond to different cohorts of students, rather than a longitudinal follow-up of the same individuals, allowing for a comparative analysis of academic performance trends before and after the implementation of the support program. This analysis contributes to a deeper understanding of the most effective strategies to support students at risk of academic failure and enhance their performance, in line with previous research on the topic (López, 2022; Sánchez, 2021; Torres, 2016).

## Materials and methods

### Research design

This study employed a retrospective observational design to analyze academic performance data from medical students enrolled in the undergraduate medical program at the Universidad Francisco de Vitoria (UFV) between the academic years 2010–2011 and 2023–2024. Beginning with the launch of the medical program at UFV.

To assess the impact of the Comprehensive Academic Support and Mentoring Program (CASMP), faculty performance was compared between two distinct periods: the pre-CASMP

TABLE 1 IAP students and highest enrolled year.

Highest enrolled year	Percentage IAP students
1	18%
2	20%
3	23%
4	16%
5	12%
6	11%

years (2010–2011 to 2014–2015) and the post-CASMP years (2015–2016 to 2023–2024) with different samples of IAP students in each period.

An IAP student was defined as any student who did not meet the academic performance standards established by the UFV Medical Program, which required students to pass at least 70% of their enrolled credits if the enrolled 60 credits or less, or 40 credits if they enrolled in more than 60 credits (from academic years 2010–2011 to 2014–2015) or 60% of the total enrolled credits (from 2015–2016 onward). It is important to note that during the pre-CASMP period, students' academic performance was not formally reviewed at the end of the academic year, no enrollment guidance was provided, and no interventions or recommendations were offered beyond those given by individual course instructors. No personalized academic support was available.

## Population and sample

The total populations of students enrolled in the 14 years observed were 7,861 ( $M$  students enrolled per year = 561.5;  $SD$  = 232.35;  $min$  = 49;  $max$  = 777), showing an upward trend over time. Distribution by gender was 5,995 women (76.26 %) and 1,866 men (23.73%). The sample IAP group included a total of 432 students (7.49 %) across the 14-year study period, with a mean of 42.07 students per year ( $SD$  = 19.81;  $min$  = 3.60%;  $max$  = 14.29%). Distribution by gender was 311 women (71.99 %) and 121 men (28.01%).

## Data collection

The variables considered in this study include gender and academic variables such as number of students enrolled per academic year and classification of academic achievement (Sufficient/Insufficient Academic Performance—IAP, based on institutional criteria). Few students and relatives' testimonials about the support program received it by mail were also reported without any identification.

The data were obtained from institutional academic records maintained by Universidad Francisco de Vitoria (UFV). Academic performance data were extracted from the university's internal analytics platform, QlikView, which compiles official records of student enrollment and achievement. Complementary data were collected from CASMP intervention records, which document academic support sessions conducted during the same period, as well as from the Admission Service at the Faculty. These

sources provided information on enrollment figures, gender distribution, academic performance classification, scholarship status, and admission criteria. No psychological or personal data were used in the analysis, in accordance with institutional data protection policies.

## Data analysis

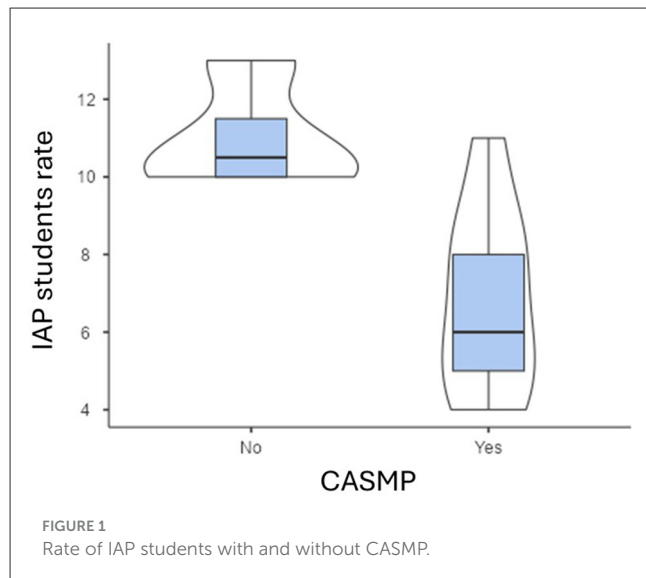
The categorical variables collected, such as gender, total IAP or total Recovery rates, were described using frequencies and percentages, while quantitative variables, such as percentage of IAP or Recovery, were expressed by median (*Med*) and interquartile range [*IQR*].

The Chi-square test was applied to examine whether a lower dismissal rate from the medical degree program was associated with having received support from the CASMP program during the second period or with gender. Although the Shapiro-Wilk normality test did not reject the null hypothesis of normality of the distribution of percentage of IAP and Recovery during the 14 observed years, Q-Q plots and the frequency distribution did not support a normal distribution. Additionally, the sample size was limited to only 4 years before CASMP and 9 years after, so means were presented as medians and interquartile ranges. To compare the average of recovery and IAP percentages previous between the two groups of CASMP/no CASMP, the Mann-Whitney U-test was used, along with the rank-biserial correlation (*rbis*) as the effect size.

This study did not require specific approval from an ethics committee or the collection of informed consent, as the data used were anonymized and aggregated, with no possibility of identifying individual participants. Furthermore, no additional anonymization procedures were necessary, since the dataset had already been processed to exclude any personal identifiers and was structured in a way that prevented the tracing of information back to specific individuals. The analysis was conducted using the statistical software Jamovi (version 2.5) ([The Jamovi Project, 2024](#)). The Type I error assumed for all analyses was 0.05.

## Results

60.75% of the IAP students were registered in subjects corresponding to the first through third years. The courses they failed were consistent with those most frequently failed by the general student population in Medicine. For classification purposes, any student enrolled in at least one third-year subject was categorized as a third-year student in our dataset ([Table 1](#)). This approach explains the presence of some IAP students in clinical-year subjects despite insufficient academic performance. Notably, these students had failed one or more preclinical subjects, indicating foundational academic challenges. The subject with the highest failure rate across the greatest number of academic years (11 years) was Anatomy II (second academic year), followed by Anatomy I (6 years, first academic year), and Genetics (5 years, first academic year). These findings highlight that knowledge-intensive, preclinical subjects are most frequently associated with academic failure. In contrast, clinical and skills-based subjects did not exhibit a significant failure pattern.



### Comparison of the insufficient academic performance (IAP) rate in periods with and without CASMP

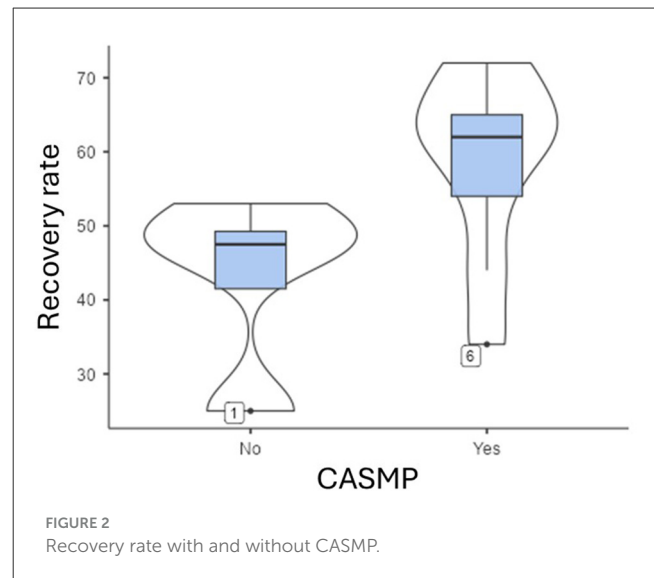
The mean percentage of students who met the UFV performance standards (no IAP) remained consistently high in the 14 years, reaching 91.58% ( $n = 7,272$ ). This ratio was 4.99% higher in the years when CASMP were available (93.36%,  $n_{\text{NO-IAP}} = 5,951$ ;  $n_{\text{IAP}} = 420$ ) than when it was not available (88.37%,  $n_{\text{NO-IAP}} = 1,321$ ;  $n_{\text{IAP}} = 169$ ), showing a significant association between the presence of CASMP and a lower ratio of IAP ( $X^2 = 39.307$ ;  $df = 1$ ;  $p < 0.001$ ).

Despite the simultaneous application of two different academic progression regulations, a downward trend in the number of students with IAP was observed during the years in which CASMP provided academic guidance and support (In fact, when examining the data under the previous regulation, we found that academic years without support had an IAP rate of 12%. With support, this rate dropped to 5%. The new regulation was always accompanied by CASMP support, and the IAP trend showed a consistent decline, with an average rate of 6.77%, reaching minimum values of 3% IAP.

As shown in Figure 1, a significant reduction in the percentage of students with insufficient academic performance (IAP) was observed following the implementation of the CASMP program. Before its introduction, the median percentage of students with IAP was  $Med = 10.50\%$  [10.00–11.50], whereas after implementation, it dropped to  $Med = 6\%$  [5–8]. The results showed a statistically significant reduction in the percentage of students with IAP during the years when CASMP was implemented ( $W = 2.50$ ;  $p = 0.020$ ;  $rbis = 0.861$ ).

### Comparison of the recovery rate among IAP students in periods with and without CASMP

An analysis of IAP students' academic outcomes revealed that, on average per year, more than half (54%) were able to



meet the required performance standards by the end of the following academic year, thereby avoiding dismissal. Notably, in the 2017–2018 and 2021–2022 academic years, over 70% of these students recovered successfully. In contrast, the lowest recovery rates were observed in 2016–2017 and 2020–2021 (34% and 44%, respectively), although these figures were still higher than the 25% recovery rate recorded in 2011–2012, when no support program was in place.

When comparing recovery rates based on the presence or absence of academic support, the data showed that only 43% of students recovered without support, whereas 59% did so when supported by CASMP. Consequently, the number of students who failed to meet academic requirements for two consecutive years—and were therefore subject to dismissal—was relatively limited. It is important to note that prior to the 2015–2016 academic year, the academic progression policy was not enforced, and students were not formally warned about it. As a result, no students were expelled during that period. However, had the policy been applied, an estimated 46 students (a mean of 9.2 per year) would have been dismissed, following an upward trend.

From the 2016–2017 academic year onward, a total of 81 students (11, 44%) were dismissed due to insufficient academic performance (IAP), either through transfer or formal expulsion from the program. This corresponds to a mean of 16 (46%) students per year, with a downward trend observed in the last five academic years, indicating improved retention.

Of 100% of underperforming students (IAP) in the period prior to PIDA, 50.55% were dismissed. In contrast, of 100% of underperforming students in the second period, with CASMP, 39.521% were dismissed. However, no significant association was found between having received CASMP and a lower dismissal rate ( $\chi^2 = 3.573$ ,  $df = 1$ ,  $p = 0.058$ ). No statistically significant increase was found in the percentage of IAP students who recovered in the years when CASMP [ $Med = 62$  (54–65)] was implemented compared to the years without it [ $Med = 47.50$  (41.50–49.25)] ( $W = 6.00$ ;  $p = 0.076$ ,  $rbis = 0.667$ ). However, a descriptive increase was observed between the two periods (Figure 2).



## Comparison of the insufficient academic performance (IAP) rate between genders

In the UFV Medicine program, women represent the majority of the student population, with an average of 76%. A similar gender distribution ( $\chi^2 = 0.107$ ;  $gl = 1$ ;  $p = 0.744$ ) was observed among students participating in the IAP initiative, with 74% identifying as female and 26% as male. This alignment suggests that the IAP cohort reflects the broader demographic trends within the program. The percentage of women in the IAP group (74%) was significantly higher than that of men (26%) ( $p < 0.001$ ). Ser hombre parece estar significativamente asociado ( $\chi^2 = 4.608$ ;  $df = 1$ ;  $p = 0.039$ ), con un mayor ratio de IAP (6.48%) en comparación con el grupo de mujeres (5.18%).

## Impact of academic progression regulations

Under the first regulation, 12% of students failed to meet the required standard during the pre-CASMP years, compared to only 5% during the CASMP-supported years—a statistically significant reduction. Although it was not possible to compare IAP rates under the second regulation before and after CASMP, since both were introduced simultaneously, the data showed that only 7% of students failed to meet the new standard. This suggests that the difference in IAP rates was not due to the change in regulation (5% vs. 7%), but rather to the presence or absence of the CASMP program (12% vs. 5%), further confirming the positive impact of academic support.

An increase in IAP cases was observed in the 2016–2017 academic year, coinciding with the simultaneous application of both regulations. Although the IAP rate reached 11% ( $n = 78$ ), this was still lower than the 12% ( $n = 85$ ) observed during the pre-PIDA years. Moreover, the rate declined in the following year and did not reach similar levels in subsequent academic years.

## Student and family testimonials

To conclude, several excerpts from emails sent by students at risk of academic dismissal, or their family members, reflect the emotional and personal impact of the CASMP support program:

*“I’ve overcome academic underperformance! Thank you so much for your encouragement.”* — Student who recovered after one year with IAP.

*“I’m deeply grateful for the care and dedication you put into everything you do. It may sound exaggerated, but I thank life for putting you in my path.”* — Student in her second year with IAP.

*“I just wanted to thank you for your attention and support this year. Thank you for everything. If I ever come by, I’ll stop in to greet you in person.”* — Student dismissed due to IAP.

*“I just wanted to say thank you for talking with me about my doubts regarding the undergraduate medical program (...) and for helping me with my parents and making this decision.”* — Student requesting a transfer to another program.

*“Thank you so much for helping our daughter these past years. We know you’ve been a great support to her (...) and we’re very proud to have chosen a university that genuinely cares about its students.”* — Parents of a student with IAP.

## Discussion

The undergraduate medical program at Universidad Francisco de Vitoria (UFV) is a six-year curriculum (360 ECTS credits) designed to provide comprehensive, person-centered medical education. The curriculum is structured into two main phases: a preclinical phase during the first two academic years, which includes foundational subjects such as anatomy, physiology, and biochemistry; and a clinical phase from the third to the sixth year, which integrates both theoretical and practical training across various medical specialties. Humanistic, ethical, and simulation-based training is incorporated from the first year and maintained transversally throughout the entire program (Rigual Bonastre, 2014).

UFV is a private university located in Madrid, Spain. Its admission process combines academic and personal criteria (O’Flynn et al., 2013). Applicants must achieve a minimum score of 10.5 out of 14 on the Spanish University Entrance Examination (PAU) (National Institute for Testing and Evaluation (NITE), n.d.), present a strong high school academic record, and pass a psychological assessment. Although the minimum PAU score required by UFV is lower than that of most public universities in Spain—such as Universidad Complutense de Madrid or Universidad de Barcelona—other private institutions like Universidad de Vic (UVic-UCC) have established similar cut-off scores, suggesting comparable academic profiles.

Despite the selective admission process, some students still face significant academic challenges, highlighting the importance of continuous support mechanisms throughout their medical education (Tan, 2024; Ramos-Monsivais et al., 2024).

The university does not collect direct data on students’ socioeconomic background. However, given that UFV is a private institution with relatively high tuition fees, it is inferred that most students belong to middle- or upper-class families. Some students finance their studies through financial aid or scholarships. According to self-reported data collected during academic support sessions, none of the students classified under Insufficient Academic Performance (IAP) were recipients of financial scholarships during the academic year in which they were identified.

To better understand the academic challenges faced by UFV medical students, it is essential to examine the institutional response to underperformance through the implementation of the CASMP program.

At the end of the 2014–2015 academic year, a growing number of medical students were identified as failing to meet the required academic performance standards. In response, UFV established the Comprehensive Academic Support and Mentoring Program (CASMP), led by a faculty member designated as the Student Coordinator. The program implemented both corrective and preventive strategies, including individual and group tutoring, academic workshops, peer mentoring, and collaboration with

psychological and pedagogical support services (Delgado Saeteros et al., 2024; Valenzuela et al., 2021).

Students were classified as having insufficient academic performance (IAP) if they failed to meet the required percentage of passed credits. Before 2015–2016, students had to pass at least 70% of enrolled credits (or 40 credits if they enrolled in more than 60). From 2015–2016 onward, students were required to pass at least 60% of their enrolled credits, regardless of the total.

These results correspond to different cohorts of students, rather than a longitudinal follow-up of the same individuals, allowing for a comparative analysis of academic performance trends before and after the implementation of the support program.

The revised regulation contributed to reducing academic overload. Although statistical analyses did not show significant differences in IAP rates during the transition years, a clear downward trend in insufficient academic performance was observed once the new regulation was fully implemented. The mean IAP rate decreased from 7.5% to 5%, suggesting a sustained improvement.

The mean percentage of students meeting the academic progression standards remained high, at 91%. This figure was significantly higher in the years when academic support was available, with a 7% increase compared to unsupported years (87% vs. 94%). The lowest performance rate during the CASMP years (89% in 2016–2017) was comparable to the highest rates in the pre-CASMP period (90% in 2011–2012 and 2012–2013), suggesting a stabilizing effect of the intervention.

A reduction in the percentage of students with IAP was also observed. While 12% of students experienced IAP in unsupported years, this figure dropped to 7% in years with academic support. The null hypothesis of independence between receiving support and avoiding IAP was rejected ( $\chi^2 = 38.625$ ;  $df = 1$ ;  $p < 0.001$ ), indicating a significant association between academic support and improved performance (Ajjawi et al., 2020; Tan and Prihadi, 2022).

These findings suggest that structured academic support not only improves performance but also enhances student retention, particularly among those at risk of dismissal.

Moreover, students at risk of dismissal due to two consecutive years of underperformance were more likely to recover when supported by CASMP. Over half (54%) of these students met the required standards in the following year, with recovery rates exceeding 70% in 2017–2018 and 2021–2022 (Ajjawi et al., 2019; Zacharias and Ajjawi, 2020).

A downward trend in academic dismissals was observed following the implementation of CASMP. From 2015–2016 onward, an average of 9 students per year were dismissed, with a decreasing trend over the last five academic years. These findings underscore the effectiveness of CASMP in reducing academic failure and improving student retention (Vaughn et al., 2012; Carbonari et al., 2024).

The creation of the comprehensive support program for medical students is grounded in various learning theories that acknowledge the complexity of the educational process in demanding contexts such as medical education (Aguilar Aguilar and Manzano Soto, 2018; Camacho Lizárraga, 2018; Manzano Soto et al., 2012). From Vygotsky's sociocultural perspective, learning is enhanced through interaction with others, which justifies the presence of a counselor and a mentor as key figures in the academic

and emotional development of students. Likewise, the humanistic theory of Maslow and Rogers emphasizes the importance of addressing basic emotional needs to foster meaningful learning, supporting the inclusion of psychological support strategies within the program. Furthermore, Zimmerman's self-regulated learning approach guides academic support actions toward the development of planning, monitoring, and self-assessment skills, which are essential for successfully facing curricular challenges. Finally, Kolb's experiential learning model and the constructivist theories of Piaget and Bruner reinforce the idea that students actively construct knowledge from their experiences, which is why the program promotes spaces for reflection and dialogue that integrate academic and emotional experiences into the learning process.

The present study is based on retrospective observational data collected from institutional academic records. As such, it is subject to inherent limitations of non-experimental designs, including the absence of randomization and the presence of potential confounding variables that were not controlled. Moreover, the retrospective nature of the study limits access to systematic qualitative records regarding the content addressed during individual mentoring sessions. Consequently, the analysis focuses exclusively on objective indicators of academic success.

Additionally, the study was conducted within a single institution and focused exclusively on students enrolled in an undergraduate medical program, which may limit the generalizability of the findings to other academic disciplines or educational contexts. The lack of qualitative data also restricts a deeper understanding of students' personal experiences within their learning environment and with the support program.

Another limitation is the absence of a control group of IAP students who did not receive support through the CASMP program. This was due to ethical considerations, as the Faculty did not deem it appropriate to withhold personalized support from any student.

Despite these limitations, the 14-year duration of our study allows for the observation of structural changes and sustained trends over time. The sample size of 589 students is substantial compared to other published studies, which often include smaller or more heterogeneous populations.

Future studies could explore the long-term academic and professional trajectories of students who participated in the CASMP program, including their performance in clinical rotations and postgraduate training. Comparative studies across institutions with similar support programs would also be valuable to assess the replicability and scalability of the intervention. Furthermore, incorporating mixed-methods approaches that include qualitative interviews or focus groups could provide richer insights into the mechanisms through which academic support influences student outcomes (Vera Gil, 2024).

## Conclusion

This study examined the academic performance of medical students at Universidad Francisco de Vitoria (UFV) over a 14-year period, focusing on the impact of the Comprehensive Academic Support and Mentoring Program (CASMP). The results revealed a consistent improvement in student outcomes following

the implementation of CASMP in the 2015–2016 academic year. Specifically, the proportion of students meeting academic progression standards increased, while the rate of insufficient academic performance (IAP) declined significantly.

Students at risk of dismissal due to two consecutive years of underperformance were more likely to recover when supported by CASMP. More than half of these students met the required standards in the following academic year, with recovery rates exceeding 70% in some cohorts. Additionally, the number of students dismissed for academic reasons showed a downward trend, highlighting the program's effectiveness in promoting retention and preventing academic failure.

These findings underscore the importance of structured academic support in medical education. The CASMP program provided both corrective and preventive interventions, including personalized tutoring, mentoring, and academic skills workshops. This comprehensive approach helped students develop essential competencies such as time management, resilience, and self-regulated learning strategies, which are critical for success in demanding academic environments.

The results of this study align with existing literature on the positive effects of academic interventions and emotional support in higher education. In the context of medical training, where students face high cognitive and emotional demands, programs like CASMP play a vital role in fostering academic achievement and personal development. The sustained institutional commitment to student support at UFV reflects a broader educational philosophy centered on holistic student care.

In conclusion, the CASMP program has proven to be a valuable tool for improving academic performance and reducing failure rates among medical students. Its implementation has contributed to a more supportive and effective learning environment, reinforcing the need for early intervention and continuous academic guidance in medical education.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional

requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

## Author contributions

IH: Supervision, Writing – original draft, Methodology, Writing – review & editing, Conceptualization, Formal analysis, Investigation, Data curation. RC-V: Formal analysis, Validation, Visualization, Writing – review & editing.

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## Conflict of interest

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