

SYSTEMATIC REVIEW

## Support for Medical Students at Risk of University Dropout: Systematic Review

### Atención a estudiantes de medicina en riesgo de deserción universitaria: Revisión sistemática

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Cite as: Loor Vines LW. Support for Medical Students at Risk of University Dropout: Systematic Review. *Seminars in Medical Writing and Education*. 2025; 4:417. <https://doi.org/10.56294/mw2025417>

Submitted: 09-07-2025

Revised: 22-09-2025

Accepted: 12-11-2025

Published: 13-11-2025

Editor: PhD. Prof. Estela Morales Peralta 

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#### ABSTRACT

**Introduction:** dropping out of medical school is rarely a simple or isolated decision; more often, it is the result of a series of silent, accumulating challenges. Factors such as financial hardship, lack of guidance, mental health issues, or the pressure of having to work while studying gradually weaken the student's connection to their academic path.

**Objective:** to analyze strategies and programs aimed at supporting students at risk of university dropout in international and Latin American contexts, identifying best practices to guide the design of effective interventions in higher education.

**Method:** this systematic review compiles fragmented academic evidence on support strategies for medical students at risk of dropout, focusing on international and Latin American contexts. An exhaustive search was conducted in PubMed, Science Direct, Scielo, and Google Scholar over a 10-year period (2015-2025), retrieving 263 articles. After removing duplicates and assessing relevance, 220 documents were reviewed, and 27 were selected based on their significance.

**Results:** dropout among medical students is a multifactorial phenomenon. Strategies such as early warning systems, mentorship, psychological support, and curricular flexibility have proven effective in reducing dropout rates, especially in Latin America. Peer mentoring programs and formative assessment improve retention, well-being, and academic performance. Their integration into sustainable institutional models shows greater long-term effectiveness.

**Conclusions:** dropout in medical education is a multifactorial issue that goes beyond statistics and demands a holistic understanding of the student. The most effective strategies are those that humanize support, adapting to students' real and diverse needs.

**Keywords:** Higher Education; University Dropout; Retention Strategy; Support Program.

#### RESUMEN

**Introducción:** la deserción de la carrera de medicina en la universidad no suele ser una elección sencilla ni aislada; muchas veces es el desenlace de una serie de obstáculos que se acumulan en silencio. Factores como las dificultades económicas, la falta de orientación, problemas de salud mental o la presión de trabajar mientras se estudia van debilitando poco a poco el vínculo del estudiante con su carrera.

**Objetivo:** analizar estrategias y programas de atención a estudiantes en riesgo de deserción universitaria en contextos internacionales y latinoamericanos, identificando buenas prácticas que orienten el diseño de intervenciones efectivas en la educación superior.

**Método:** esta revisión sistemática sistematiza evidencia académica fragmentada sobre estrategias de apoyo a estudiantes de medicina en riesgo de deserción, centrándose en contextos internacionales y latinoamericanos.

Se realizó una búsqueda exhaustiva en PubMed, Science Direct, Scielo, Google Scholar, BioMed Central, ResearchGate durante 10 años (2015-2025), recuperando 263 artículos. Tras eliminar duplicados y evaluar pertinencia, se analizaron 220 documentos y se seleccionaron 27 por su relevancia.

**Resultados:** la deserción en estudiantes de Medicina es multifactorial. Estrategias como alerta temprana, mentorías, apoyo psicológico y flexibilidad curricular han reducido el abandono, especialmente en Latinoamérica. Programas de tutorías entre pares y evaluación formativa mejoran la permanencia, bienestar y rendimiento. Su integración en modelos institucionales sostenibles demuestra mayor efectividad a largo plazo.

**Conclusiones:** la deserción en Medicina es un fenómeno multifactorial que trasciende lo estadístico y exige una mirada integral del estudiante. Las estrategias más efectivas son aquellas que humanizan el acompañamiento, adaptándose a sus necesidades reales.

**Palabras clave:** Educación Superior; Deserción Universitaria; Estrategia de Retención; Programa de Atención.

## INTRODUCTION

University dropout is one of the most complex, persistent, and sensitive challenges currently facing higher education institutions, both in developed contexts and in those marked by profound structural inequalities.

<sup>(1)</sup> Far from being an isolated phenomenon, it reflects a network of interrelated factors that affect students' lives: adverse socioeconomic conditions, limitations in curriculum design, inadequate vocational guidance, insufficient institutional support, mental health difficulties, and the often urgent need to balance studies with work. Therefore, it cannot be understood as a simple individual decision, but rather as the cumulative result of obstacles that, if not addressed promptly, ultimately marginalize the student from the educational system.<sup>(2)</sup>

In this context, the dropout rate has become a crucial indicator for measuring the efficiency, effectiveness, and equity of university systems. Beyond the numbers, each student who drops out represents an interrupted story, a life project that is cut short, and a significant loss for society, which invests in the education of citizens with the expectation that they will contribute to social, scientific, and economic development.<sup>(3)</sup> It is, therefore, an issue that cannot be analyzed solely in terms of institutional metrics but requires an ethical, human, and structural understanding of the phenomenon.

In countries with more established university systems, particularly in Europe, North America, and certain Asian nations, the issue of dropouts has been addressed systematically through coherent public policies, ongoing research, and institutional early intervention programs. These countries have understood that ensuring retention is not only the responsibility of the student, but also of the institution and the state.

<sup>(4)</sup> They have therefore invested in comprehensive support models, personalized tutoring, career guidance, psychological counseling, early warning systems, and targeted financial aid. These strategies have led to a sustained reduction in dropout rates and transformed university cultures toward models focused on student well-being and success.<sup>(5)</sup>

In Latin America, on the other hand, the approach to this problem has been more recent, often limited by budgetary constraints, a lack of sustained public policies, or administrative rigidities that hinder the implementation of comprehensive programs.<sup>(6)</sup> However, in recent years, many universities in the region have begun to recognize the need for action. Valuable experiences have been developed which, although diverse in scope and depth, demonstrate a growing effort to adapt international models to local contexts. These actions, driven by committed teams, seek to address the multiple dimensions of student dropout with contextualized, innovative, and empathetic solutions.<sup>(7)</sup>

A review of the specialized literature on the subject reveals that the most effective strategies are not limited to the academic sphere. On the contrary, those that achieve the most significant impact are those that integrate socio-emotional, vocational, and economic aspects. Among the most notable practices are ongoing academic counseling, emotional support spaces, peer mentoring programs, flexible financial aid, and psycho-pedagogical support, which together form a support network focused on the student as a whole person.<sup>(8)</sup> When these strategies are articulated in a coherent manner and with an institutional vision, they allow for intervention at critical moments in the student's trajectory and significantly reduce the risk of dropout.

A reality that deserves special attention is that many students who drop out of college do so not because of a lack of intellectual ability or commitment to their education, but because of a combination of personal, family, and structural difficulties that are not addressed or responded to promptly within the institutions. This disconnect between student needs and institutional responses highlights the importance of having monitoring and support systems that are truly sensitive to the diversity of backgrounds, conditions, and expectations of

those entering higher education.<sup>(9)</sup>

Thus, understanding dropout cannot be reduced to a statistical or normative analysis. It is a phenomenon with profound human implications, impacting not only the student but also their family and community environment. Furthermore, it has direct effects on the quality, efficiency, and sustainability of the education system as a whole.<sup>(10)</sup> From this perspective, addressing student dropout requires not only corrective actions but also a transformative view of the role of the university in the lives of its students, particularly in highly demanding academic programs such as medicine, where emotional pressure and study load can further accentuate risk factors.

In this context, it is essential to conduct a comparative analysis that enables lessons to be learned from international and Latin American experiences. This exercise does not seek to replicate what has worked elsewhere mechanically, but rather to understand why specific strategies have been effective, what conditions have made them possible, and how they can be adapted to particular institutional realities such as that of the University of San Gregorio de Portoviejo. The value of this type of systematic review lies precisely in its ability to highlight good practices, identify common patterns, and point out recurring errors that can be avoided.

For this reason, it proposes an analysis of strategies and programs for students at risk of dropping out of university through a systematic review of methods and programs aimed at students at risk of dropping out of university, implemented in both international and Latin American contexts; identifying good practices, key elements, and success factors that can guide the design of more effective, humane, and contextualized institutional interventions, especially in environments such as medical education, where dropout rates require specialized attention.

## METHOD

This systematic review was developed because, in recent years, there has been considerable fragmentation in academic research on how to support medical students at risk of dropping out of university. This situation is particularly noticeable when examining international contexts, especially in Latin America. It was precisely this dispersion of evidence that motivated this systematic review. Based on this, we proposed to address a set of key questions that guide this research and seek to shed light on the strategies currently implemented to support and retain these students in their educational trajectory.

- What strategies or programs have been developed internationally and in Latin America to support medical students at risk of dropping out of university, and which approaches are most effective?
- What are the common characteristics of the good practices identified in the literature that have succeeded in preventing student dropout in the field of medicine?
- How do social, institutional, and pedagogical contexts influence the design and implementation of interventions aimed at retaining medical students at risk of dropping out?

To carry out this research, we opted for an exploratory systematic review, following the approach proposed by Fernández et al.<sup>(11)</sup>, who highlight the importance of formulating questions that reveal gaps in evidence-based knowledge. This type of review is particularly valuable when dealing with topics where the available information is scattered or still in its infancy, as is the case with strategies aimed at medical students at risk of dropping out.

To this end, an exhaustive search of the literature published over the last decade, between 2014 and 2024, was conducted, encompassing a decade of academic production. The databases selected for this search were PubMed, ScienceDirect, Scielo, Google Scholar, BioMed Central, and ResearchGate, given their relevance and access to high-quality scientific publications in the fields of education and health. Specific terms were used as part of the search strategy, carefully defined to ensure adequate and relevant coverage of the topic, such as:

“Higher education” AND “University dropout” AND “Retention strategy” AND “Support program”; in Spanish: “Educación superior” AND “Deserción universitaria” AND “Estrategia de retención” AND “Programa de atención”; about their appearance in the title, abstract, and keywords of the articles. A total of 263 articles were retrieved from the two databases searched. The files were analyzed using EndNote X20.4.1, software to standardize them and eliminate duplicates. The 220 files remaining after this initial screening were evaluated for relevance to the topic under analysis, based on the abstract and keywords. The inclusion criteria encompassed articles from the defined period that responded to the selected keywords in both Spanish and English, as well as from journals identified in the selected databases for the study.

Documents from other types of data repositories were excluded. A total of 27 articles were selected for their relevance and correspondence with the topic analyzed.

The selection flowchart is shown in figure 1.

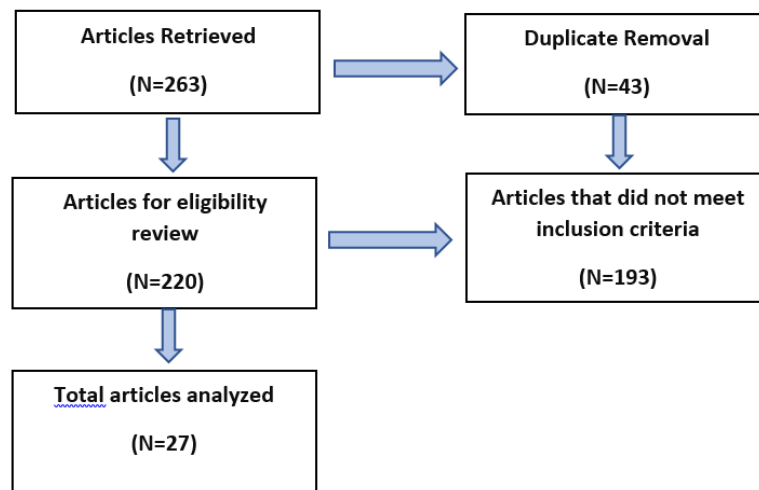


Figure 1. Article selection process

## RESULTS

### Characteristics of the selected studies

Of the total number of articles retrieved from PubMed, Science Direct, Scielo, and Google Scholar, 10,2 % were considered relevant to the study (27 studies from the last decade).

Over the last decade, there has been a growing interest in understanding why many medical students drop out of their studies. The scientific community has begun to pay closer attention to aspects that were previously overlooked. However, despite this progress, many available studies focus on specific contexts and lack a broader and more articulated perspective.

This highlights an urgent need, as it is not enough to know what factors influence dropout rates; it is essential to take a step further and explore which strategies are effective, which are not, and in what contexts. Research is needed to compare, evaluate, and synthesize real experiences, both in Latin America and elsewhere in the world, using methodological tools such as those employed in systematic reviews with a PRISMA approach. In this sense, this research is not only timely but also necessary, as it has the potential to bring together scattered learnings and transform them into concrete proposals that truly help build a more inclusive, sustainable medical education system committed to supporting its students.

The results of searches conducted in major scientific databases such as PubMed, ScienceDirect, Scielo, and Google Scholar throughout the period 2015-2025 show that, although there has been moderate growth in academic production related to university dropout among medical students, this increase has not been uniform or sustained across all regions or approaches. Figure 2, which compares the articles initially retrieved with those that ultimately met the inclusion criteria, highlights not only the growing interest in the topic but also a marked dispersion of studies and limited systematization of knowledge.

This overview suggests that, although the phenomenon has begun to attract the attention of the scientific community, there is still ample room for more structured research analyzing specific interventions. Consequently, the present study positions itself as a relevant response to this need, seeking to integrate, compare, and make sense of diverse experiences under a methodological approach such as systematic review, thus contributing to the development of practical proposals within higher medical education.



Figure 2. Comparison between retrieved articles and those selected as a sample

Table 1 provides a detailed overview of scientific productivity according to the countries of origin of the 27 studies selected for this analysis. In total, 18 countries were identified as having contributed to research in this area, with Spain 3, Ecuador 3, and the United Kingdom 3 standing out as the main players in the field. They are followed by Colombia 2, Mexico 2, and the United States 2. This geographical distribution of academic production reveals the relevance of the topic in different sociocultural and economic contexts.

| Table 1. Productivity by country |                 |
|----------------------------------|-----------------|
| Country                          | Number of Works |
| Spain                            | 3               |
| Ecuador                          | 3               |
| United Kingdom                   | 3               |
| Colombia                         | 2               |
| Mexico                           | 2               |
| United States                    | 2               |
| Uruguay                          | 1               |
| Greece                           | 1               |
| Germany                          | 1               |
| China                            | 1               |
| South Korea                      | 1               |
| Singapore                        | 1               |
| Dominican Republic               | 1               |
| Chile                            | 1               |
| Peru                             | 1               |
| Cuba                             | 1               |
| Costa Rica                       | 1               |
| Brazil                           | 1               |

Table 2 presents a more comprehensive analysis of the articles selected for this study. This table includes specific details such as the names of the authors, the year each work was published, the type of study conducted, and a concise summary of the central theme of each research project. This organization not only facilitates understanding of the approach and methodology of each article, but also allows for the identification of trends and patterns in academic production on the subject. In addition, this level of detail contributes to a comprehensive view of how the topic has been addressed in the existing literature, providing a solid foundation for future research.

| Table 2. Description of the selected sample that forms the basis of the study |                 |                                                            |                                                                            |      |
|-------------------------------------------------------------------------------|-----------------|------------------------------------------------------------|----------------------------------------------------------------------------|------|
| No.                                                                           | Citation        | Authors                                                    | Topic                                                                      | Year |
| 1                                                                             | <sup>(12)</sup> | Suberviola I, Nalda FN, Marcos AG                          | Factors influencing the intention to drop out of school early              | 2024 |
| 2                                                                             | <sup>(14)</sup> | Mendoza VF, Garces CJ, Vera JD, Quiroz SM                  | Systematic review of school dropout among Ecuadorian adolescents           | 2025 |
| 3                                                                             | <sup>(18)</sup> | Suarez Patiño AP                                           | Documentary review on factors and strategies for addressing school dropout | 2024 |
| 4                                                                             | <sup>(20)</sup> | Suárez Cadavid E, Lemos M, Ruiz González EP, Krikorian A   | Empathy, compassion, and burnout in medical students                       | 2022 |
| 5                                                                             | <sup>(22)</sup> | Esquivel DM, Carballo PQ, Rodríguez YQ, López AL, Rojas DM | Mental health and suicide risk in Costa Rican university students          | 2024 |
| 6                                                                             | <sup>(23)</sup> | Veloso Pérez E, Puga García A, Veloso Rodríguez A, et al.  | Motivational profile of medical students                                   | 2024 |
| 7                                                                             | <sup>(27)</sup> | Toral CK, Mera MV, Gracia NS, Arroyo HG                    | Mental fatigue and academic performance                                    | 2023 |
| 8                                                                             | <sup>(32)</sup> | Pérez-Martinot M                                           | Role of the mentor in medical education                                    | 2024 |
| 9                                                                             | <sup>(33)</sup> | Olivares MJ, Ramírez-Barrantes R                           | Meditation as a strategy against burnout in medicine                       | 2024 |
| 10                                                                            | <sup>(34)</sup> | Garcimarrero Espino EA                                     | Protective factors for mental health in medical students                   | 2021 |



|    |      |                                                             |                                                                       |      |
|----|------|-------------------------------------------------------------|-----------------------------------------------------------------------|------|
| 11 | (36) | Cruz EYL, Bello EOG, Nénninger EHE                          | Interdisciplinarity in the university curriculum: systematic review   | 2025 |
| 12 | (39) | Gutiérrez RC, Rivas HP, López EL                            | Theoretical reflections on academic dropout                           | 2024 |
| 13 | (40) | Sánchez Oliván E, Munive Gutiérrez AA, Martínez Hernández M | Active retrieval and spaced repetition in medicine                    | 2024 |
| 14 | (41) | Wan DWJ, Goh LSH, Teo MKY, et al.                           | Self-care education for medical students                              | 2023 |
| 15 | (43) | Albert FA                                                   | Systematic review on retention and review in physicians               | 2024 |
| 16 | (45) | Fernández Álvarez A, et al.                                 | Academic performance and lagging behind in medical students           | 2022 |
| 17 | (46) | Torres Rentería S, Escobar Jiménez C                        | Determinants of dropout and retention in medicine (Ecuador)           | 2022 |
| 18 | (50) | Farkas AH, et al.                                           | Mentoring of medical students in the US: systematic review            | 2019 |
| 19 | (51) | Atlas AM, et al.                                            | Global medical mentoring                                              | 2021 |
| 20 | (52) | Seo C, et al.                                               | Resilience curriculum for burnout in medical education                | 2021 |
| 21 | (53) | Ge WL, et al.                                               | Critical thinking and clinical skills with PBL: systematic review     | 2025 |
| 22 | (54) | Offiah G, et al.                                            | Retention of clinical skills through simulation                       | 2019 |
| 23 | (55) | Akinla O, et al.                                            | Peer mentoring: systematic review                                     | 2018 |
| 24 | (57) | Gehreke L, Schilling H, Kauffeld S                          | Effectiveness of peer mentoring at the start of university studies    | 2024 |
| 25 | (58) | Prevolos C, et al.                                          | Peer mentoring in medicine: stress reduction and adjustment           | 2024 |
| 26 | (60) | Gomes LMLS, Oliveira AASD                                   | Retention policy at a Brazilian university with psychological support | 2022 |
| 27 | (61) | Trullàs JC, et al.                                          | Effectiveness of problem-based learning (PBL) in medicine             | 2022 |

Based on a detailed analysis of the studies that comprise the selected sample, three thematic categories were identified and organized, serving as the basis for structuring the approach of this study. These categories did not arise arbitrarily, but were defined after carefully examining the content of the included articles, allowing us to recognize common patterns and recurring approaches related to attention and retention strategies in the field of medical education. This classification process not only allowed the information to be presented in a clear and orderly manner in the sample description table but also facilitated a more comprehensive reading of the findings by directly linking each study to the research questions. In addition, this thematic organization helped to highlight the areas most addressed by the literature and those that still require further exploration, contributing to the discussion and giving critical meaning to the results obtained.

### Risk factors for dropout among medical students

Student dropout in medical school is a multidimensional problem with personal, institutional, and social repercussions. This category, the first in the framework of this systematic review, focuses on the risk factors that predispose students to drop out of their studies.<sup>(12,13)</sup> In this sense, dropout should not be understood as an abrupt act, but as the outcome of an accumulation of adverse situations that weaken the student's academic commitment and their permanence in the educational system.<sup>(14)</sup>

Dropout is defined as the definitive or prolonged interruption of the educational process before completing an academic level.<sup>(15)</sup> In medicine, this phenomenon is particularly relevant due to the high level of demand, the length of the degree program, and the social implications of having health professionals in training. Various studies agree on four main groups of risk factors for dropout: personal, academic, institutional, and social. However, these do not act in isolation; on the contrary, they interact and reinforce each other, which complicates the understanding of the phenomenon.<sup>(16)</sup>

On a personal level, motivation proves to be a critical factor. Low or unstable motivation, especially when confronted with an academic reality that is more demanding than expected, leads to a progressive deterioration in commitment to the program.<sup>(17,18)</sup> This situation is often accompanied by mental health issues such as anxiety, depression, insomnia, or chronic stress, which, if not treated promptly, increase the risk of

dropout. Likewise, socioeconomic conditions, such as the need to work to finance studies or lack of access to technology, exacerbate this vulnerability.

Academic factors, meanwhile, are related to the perception of curriculum overload, traditional teaching methods, punitive assessment, and limited flexibility in training processes. In many cases, students struggle to adapt their learning strategies to the demands of the medical curriculum, resulting in low grades, failure, and, consequently, increased personal frustration. In qualitative studies, students have expressed that the transition from the basic to the clinical stage is one of the most critical moments, especially when there is insufficient faculty support.<sup>(19)</sup>

The institutional context also plays a decisive role, as the lack of teaching resources, inadequate laboratories, infrastructure deficiencies, budgetary constraints, and the limited availability of clinical fields for professional practice create an academic climate that is perceived as unwelcoming. Added to this is the perception of a distant relationship with teachers, who often fail to establish meaningful pedagogical relationships, reducing students' ability to express doubts, ask for help, or feel part of a learning community.

The institutional climate, understood as the emotional, relational, and organizational environment of the university, influences the perception of belonging and motivation. When this climate is hostile, for example, due to authoritarian practices, lack of recognition, or extreme competitiveness among peers, students tend to isolate themselves, reducing their academic involvement.<sup>(20)</sup> Likewise, assessment systems that are unclear or disproportionate in relation to the level of education end up reinforcing disenchantment and fueling the intention to drop out.

Social factors, for their part, cannot be underestimated, as the support network surrounding the student—family, partner, friends, classmates—is essential to sustain them emotionally in times of academic or personal crisis. The lack of this support, or the presence of conflictive relationships, can have a destabilizing effect. Feelings of loneliness, limited socialization, and a lack of understanding from those around them gradually erode the will to continue, especially in the early years, when students are still adapting to university life.<sup>(21)</sup>

Recent studies conducted with medical students reveal that they identify repeating courses as stressful, especially when their families experience distress about their academic performance. Chinese and American research has documented a close relationship between mental health, social support, and the risk of suicidal behavior.<sup>(22)</sup>

Similarly, in Latin American contexts, high rates of demotivation have been reported, linked to vocational disillusionment caused by the discrepancy between idealized expectations about the career and the reality of training, which is highly demanding and emotionally exhausting.<sup>(23,24)</sup>

Several studies have identified that the combination of low motivation, mental health problems, and economic insecurity constitutes a high-risk triad for dropout.<sup>(25)</sup> Added to this is the weight of the academic load, which affects sleep quality, family life, and participation in extracurricular activities. It has been observed that students with poor coping skills or difficulties in organizing their time have a higher dropout rate, especially in the first semesters. Twenty-six student narratives demonstrate that, in adverse contexts, human support from teachers or peers can serve as a protective factor, mitigating the risk of dropout. Support, both academic and emotional, is not only complementary but a structural necessity in the medical training process.

In the context of the transformations required by contemporary medical education, Galarza et al. highlight that emotional education represents a high-impact pedagogical innovation, as it responds to current social needs and contributes to balancing cognitive development with the appropriate management of emotions, a fundamental aspect for the clinical and human performance of future health professionals.<sup>(27)</sup> In this regard, the author of this paper agrees with the authors that strengthening students' emotional intelligence not only improves their academic and clinical performance but also promotes their personal well-being and their ability to establish empathetic and ethical relationships with patients. This perspective broadens the traditional approach to medical education, paving the way for more humane, resilient, and sustainable models of care.

In this sense, the analysis of the risk factors associated with dropout among medical students reveals a complex and multifactorial problem, in which personal, academic, institutional, and social variables converge. Understanding these dimensions is crucial for developing effective strategies that enhance student retention and achievement.

Early identification of these factors, together with timely support, is a key tool for mitigating the risk of dropout and promoting successful academic trajectories.

### **Institutional strategies for supporting students at risk of dropping out**

In recent years, concern about university dropout rates in medical programs has become a priority on the academic agendas of many higher education institutions, both in Latin America and in other international contexts. This situation is not limited to statistics reflecting early dropout. Still, it is based on the interrupted stories and trajectories of hundreds of young people who, having chosen a profession of vocation and dedication, encounter multiple barriers to continuing their education. Therefore, institutional strategies for their care

cannot be generic or oblivious to the diversity of this student group.<sup>(28)</sup>

One of the most robust approaches, with accumulated empirical evidence, is the implementation of early warning systems, which allow universities to anticipate dropouts by identifying risk signals such as non-attendance, sustained poor performance, or social isolation.<sup>(29)</sup> However, it is pertinent to ask whether these alerts are effective in Latin American contexts, where structural challenges such as connectivity or the administrative burden on teachers could limit their functionality. The experience of the University of La Sabana in Colombia, which adapted this model to its institutional reality, suggests that it is possible. However, it requires careful cultural and technical adaptation.<sup>(30)</sup>

However, it is not enough to detect the risk if timely intervention is not provided. In this regard, academic tutoring and personalized mentoring have been among the most significant responses. Beyond their traditional role of supporting learning, tutors have become emotional and social bridges connecting students to the university.<sup>(31)</sup>

Medical students who have a mentor have higher retention rates, better academic performance, and report feeling less lonely. As a teacher, I must mention that on many occasions, I have seen how an honest and timely conversation can prevent a decision to drop out. This interaction allows us to identify the specific difficulties faced by the student and, from there, design personalized strategies that encourage them to remain in the educational system.<sup>(32)</sup> The implementation of mentoring programs, psychological support, and academic advising is essential to strengthening students' sense of belonging and motivation. Support, in the most human sense of the term, remains irreplaceable.

The medical career, with its heavy workload of practical hours, constant evaluation, and early exposure to human suffering, has profound effects on students' mental health. Organizations such as the WHO have warned of an increase in symptoms of anxiety, depression, and burnout among those studying health sciences.<sup>(33)</sup>

In a study conducted by Espino, he identified the urgent need to implement sustainable strategies and programs that promote the overall health of students. Particular emphasis is placed on incorporating mental health prevention, promotion, and care actions into both the formal curriculum and the implicit dynamics of the university environment, reaffirming the active role of educational institutions in the comprehensive training and psychological well-being of future health professionals.<sup>(34)</sup> The study also highlights the need to offer specialized psychological care as part of a broader commitment to the comprehensive support of future healthcare personnel.

It is, however, impossible to ignore the weight of socioeconomic conditions in this phenomenon. Financial support through scholarships, grants, or comprehensive assistance programs has proven to be a powerful buffer against dropout rates. There is an abundance of literature on this subject.<sup>(35)</sup> From World Bank reports to regional analyses by ECLAC, it has been documented that access to financial resources determines retention.<sup>(36)</sup> But beyond the data, there are students in classrooms who, despite their talent and vocation, are forced to abandon their studies because they cannot afford transportation or clinical materials.

On the other hand, curricular flexibility is an essential strategy in an environment where student trajectories are not linear. Offering options such as justified academic breaks, schedule adjustments, or the possibility of repeating courses without penalty has allowed many students to reorganize their academic lives without having to give up.<sup>(37)</sup> Curricular rigidity in higher education institutions often expels students more than personal difficulties do.<sup>(38)</sup> Some Latin American universities, such as the University of Antioquia and the University of Chile, have reformulated their permanence regulations to make them more humane and contextual, something that I personally consider urgent and replicable.<sup>(39)</sup>

The formative and emotional value of building a sense of belonging cannot be overlooked. When a student feels part of an academic community and finds a space of recognition within their group of peers and teachers, the chances of dropping out decrease. This sense of belonging is cultivated from the symbolic, such as career initiation ceremonies, to the everyday, including participation in extracurricular activities, study groups, and solidarity projects.<sup>(40)</sup> These actions strengthen students' sense of belonging and motivation, which is essential for preventing dropout. Additionally, the institution should implement personalized support systems that identify early signs of risk and provide academic, psychological, and social support.

Other strategies, such as formative assessments, the use of educational technologies, academic remediation programs, and interdisciplinary interventions, also contribute to the evidence in favor of their implementation. Universities that have opted for assessments with feedback, adaptive virtual learning environments, and comprehensive approaches to risk cases report improvements not only in retention but also in the quality of learning and the overall well-being of students.<sup>(41)</sup> Personally, I value experiences where multidisciplinary teams are brought together to address risk situations in a joint and non-fragmented manner.

Ultimately, the most effective institutional strategies are not those applied from an administrative perspective, but those based on recognizing students as whole individuals with cognitive, emotional, social, and ethical needs. University dropout rates are not simply a statistic to be reduced; they are a moral responsibility that challenges the way we conceive of medical education, the role of the university, and our own commitment



as teachers.

### Academic and psychoeducational practices aimed at retention

To discuss university dropout rates among medical students without considering the emotional, cognitive, and institutional burdens these young people face is a methodological and ethical omission. Medical training, due to its demanding nature, requires more than just the acquisition of technical knowledge; it demands a constant balance between academic rigor, emotional maturity, and the development of a solid professional identity. In this context, academic and psychoeducational practices emerge not as ancillary actions but as fundamental pillars in student retention strategies.

From an academic perspective, one of the most notable resources with the most significant evidence of effectiveness is formative assessment. Unlike the traditional approach, which focuses on grading as the final product, formative assessment allows students to recognize their mistakes and learn from them in a non-punitive environment.<sup>(42)</sup> Hattie and Timperley emphasize that this type of assessment has one of the most significant impacts on learning, especially when accompanied by clear and specific feedback. In the clinical setting, this practice has been adapted using tools such as formative Objective Structured Clinical Examinations (OSCEs), transparent rubrics, and clinical simulation, which have improved students' competency mastery and significantly reduced assessment stress.<sup>(43)</sup>

However, learning does not occur in a vacuum, as students' psychosocial conditions, their links to the academic community, and their emotional well-being also play a decisive role. In this sense, psychoeducational practices are an essential complement. Dyrbye et al. showed that mental health programs implemented in the first semester reduce levels of exhaustion and anxiety, two factors strongly associated with dropout rates in intensive careers such as medicine.<sup>(44)</sup> Forty-four institutions, such as the National Autonomous University of Mexico and the Pontifical Catholic University of Chile, have chosen to incorporate this support into their educational models, demonstrating that it is possible to institutionalize care without compromising academic excellence.<sup>(45)</sup>

It is interesting to contrast these advances with the reality of many Latin American universities, where a fragmented view of student support still prevails. Although isolated measures have been implemented, such as orientation workshops or specific psychological counseling, they are rarely articulated in a coherent and sustained model.<sup>(46)</sup> This contrasts with more comprehensive models observed in countries such as Canada or Australia, where emotional well-being is a structural part of the curriculum and is aligned with institutional objectives of academic quality and timely graduation.<sup>(47)</sup>

At the theoretical level, explanatory models of dropout offer us diverse frameworks for interpretation. The academic model emphasizes student characteristics and performance. The psychological model addresses factors such as motivation, self-esteem, and emotional management. The institutional model focuses on the structures and conditions provided by the university. All of them, from their respective perspectives, have provided key insights into understanding a complex and multifaceted phenomenon. Mayer and Gleason, for example, propose interactionist frameworks that combine internal factors (such as academic abilities or mental health) with external factors (such as institutional practices or classroom climate), emphasizing that retention or dropout is the product of a dynamic interaction between the subject and their environment.<sup>(48)</sup>

Active teaching practices, such as problem-based learning, teamwork, peer feedback, and the use of interactive technologies, not only contribute to the acquisition of clinical skills but also foster a greater sense of belonging. Studies, such as those by Dolmans et al., show how these methodologies increase intrinsic motivation and strengthen students' commitment to their studies.<sup>(49)</sup> In the researcher's opinion, one of the current challenges is not to design new strategies, but to ensure their sustained implementation, contextualized and evaluated according to the real needs of the student body.

Indeed, student retention cannot be reduced to a simple indicator of institutional efficiency. It is not just a matter of preventing students from dropping out, but of ensuring that they remain in a dignified and healthy manner, with a clear sense of purpose. In this sense, the most effective institutional actions are those that manage to articulate comprehensive intervention programs. Academic tutoring, career guidance, study groups, extracurricular activities, and psychological support should not function as isolated entities, but rather as interdependent parts of a structural support network.<sup>(46)</sup>

Tutoring programs, for example, have proven highly effective when they focus on developing metacognitive skills, strengthening the teacher-student bond, and implementing personalized academic planning. Beyond technical assistance, tutoring allows students to feel seen and valued, which directly affects their motivation.<sup>(46)</sup> Likewise, organizing extracurricular activities, such as volunteer work, academic clubs, or cultural events, provides students with opportunities for socialization that reinforce their professional identity and institutional integration. These practices, which are often underestimated, contribute decisively to mental health, self-esteem, and the reduction of risky behaviors.<sup>(49)</sup>

From an institutional perspective, it is crucial to recognize that evaluating these practices must be an

integral part of the process. It is not enough to implement programs: it is necessary to measure their impact, adjust their scope, and ensure their relevance. To this end, a combination of qualitative and quantitative methods is recommended. While the former allow for an understanding of the student's subjective experience, the latter help to identify correlations between applied practices and retention rates. Evaluation, understood in this way, is not an exercise in control, but a mechanism for continuous improvement.<sup>(47,48)</sup>

Finally, it is essential to emphasize that both academic and psychoeducational practices should not be considered in isolation from one another. Their effectiveness is enhanced when they are articulated in comprehensive care programs, with clear objectives, trained personnel, and a cross-cutting intervention logic.<sup>(40,41,45)</sup> The challenge is not only to design good practices, but also to integrate them into the institutional ethos. One of the significant tasks pending in many medical schools is to establish a person-centered retention culture that views students not only as future professionals but also as human beings in transition, with their own needs, emotions, and dreams.

The available evidence shows that academic and psychoeducational practices have a significant and proven impact on student retention. Their success, however, does not depend solely on their design, but also on the institutional will to sustain, evaluate, and adapt them. In a career as demanding as medicine, where burnout is high and expectations are many, caring for students is also a way of caring for the future of the profession.

### **Notable experiences in international and Latin American contexts**

Understanding dropout rates in medical school solely from a theoretical or institutional perspective would be insufficient. An accurate understanding emerges from observing how specific institutions have designed and implemented effective strategies to retain at-risk students in diverse cultural, social, and economic contexts.

One notable international practice is the preventive institutional mentoring model, such as that of the University of Toronto, where each student is assigned a faculty advisor from the first semester who serves as both an academic and emotional mentor, with regular meetings and formal follow-up records. Systematic reviews indicate that these programs have a significant impact on increasing academic satisfaction, emotional well-being, and student retention.<sup>(50,51,52)</sup>

Along the same lines, the Mayo Clinic School of Medicine, one of the world's most prestigious medical institutions, based in Rochester, Minnesota, has structurally incorporated continuing education in resilience and self-care into its curriculum, recognizing its importance in the academic career of medical students. This is supported by recent systematic reviews that substantiate this decision, demonstrating that curricula focused on resilience development lead to a significant reduction in stress and burnout, two factors closely linked to dropout rates, particularly during the early years of medical school. training.<sup>(53)</sup>

The case of Maastricht University illustrates another approach: the systematic implementation of problem-based learning (PBL) as a pedagogical and retention strategy. A recent meta-analysis shows that PBL improves critical thinking and clinical skills and is associated with greater intrinsic motivation and commitment to the career.<sup>(54)</sup> At the same time, reviews on knowledge retention and clinical skills show that training interventions with distributed practice, continuous feedback, and blended learning generate medium-term skill retention, as demonstrated by studies of cardiac ultrasound skills after eight weeks of supervised teaching.<sup>(55)</sup>

In Latin America, the case of the National University of Colombia stands out. Through its Student Support System (SAE), it has developed an inclusive strategy that combines academic tutoring, peer tutoring, psycho-affective training, and socioeconomic assistance from the first day of class until graduation, recognizing the cultural and regional diversity of its community and providing each student with the confidence, sense of belonging, and institutional support network necessary to persevere in their studies, especially in contexts of vulnerability.<sup>(56)</sup>

Another relevant experience is the peer tutoring implemented at the Faculty of Medicine of the University of Buenos Aires. Recent studies in higher education have demonstrated that peer mentoring programs can significantly enhance academic and social integration, reduce dropout rates, and foster a stronger sense of belonging among students.<sup>(57)</sup> In the medical field, recent qualitative evidence suggests that this type of mentoring reduces stress and facilitates the transition for first-year students, benefiting both those who teach and those who are taught.<sup>(58)</sup>

In Mexico, the Benemérita Universidad Autónoma de Puebla (BUAP) has designed differentiated psychoeducational intervention pathways for students from rural areas or indigenous communities. This inclusive proposal transforms structural inequality into an opportunity for educational innovation, focusing on comprehensive student care.<sup>(59)</sup>

Brazilian universities have made progress with comprehensive strategies to promote student retention through social-emotional support and institutional data analysis. The Universidade Federal do Espírito Santo developed a visualization tool to map risk profiles among students and guide targeted interventions. At the same time, nine federal institutions in the Northeast implemented retention and psychological assistance policies that integrate emotional support as a key factor in reducing academic dropout rates.<sup>(60,61)</sup>

From a global academic perspective, studies indicate that institutionally assigned mentoring programs enhance student engagement and foster a stronger sense of belonging. Bose et al.<sup>(50,51,57)</sup> describe how these informal mentors act as listening and support counselors from the moment of admission, without penalty, contributing to early success. retention.<sup>(58)</sup>

Data on clinical skills retention also support these training practices: Offiah et al. found that repeated, supervised practice restores technical performance even when it has deteriorated, directly linking continuing education with academic retention.

International and Latin American experiences agree that the most successful strategies share these principles.<sup>(52,54,62,63)</sup>

- Continuous and personalized support from the outset, with formal and informal mentoring that strengthens emotional support and a sense of belonging.
- Active and distributed academic interventions that combine simulations, supervised clinical practice, and periodic feedback.
- Systematic social-emotional learning integrated into the curriculum, fostering resilience and self-care.
- Contextual adaptations according to cultural, socioeconomic, and regional diversity.
- Institutional impact assessment using mixed indicators to provide feedback and improve strategies.

Attention to students at risk of dropping out should consider the profile of teaching competencies to improve retention and academic performance.<sup>(64,65)</sup> As a research professor, it is understood that it is not a matter of replicating mechanical models, but instead of translating educational principles into actions that are contextualized to the local reality of each educational context, sustainable, and ethically responsible. Student retention in medicine is an act of professional care with repercussions for the public health of any society, and raises the quality of professional medical practice.

## CONCLUSIONS

Dropout rates in medical school are a deeply complex phenomenon that cannot be explained by a single cause or addressed from a reductionist perspective. This systematic review reveals that behind every decision to drop out lies a complex web of personal, academic, institutional, and social factors that, when combined, gradually weaken the student's connection to their career. In this sense, understanding dropout rates involves going beyond the numbers and connecting with the reality experienced by those who, despite their vocation, face barriers that compromise their permanence and well-being.

The experiences gathered in international and Latin American contexts enable us to recognize that the most effective strategies are not those imposed in a standardized manner, but rather those that understand the student as a person with a history, emotions, and specific needs. Timely support, the creation of support networks, the implementation of early warning systems, as well as curricular flexibility and the use of training tools such as simulation or tutoring, have proven to be actions that not only prevent dropout but also dignify the educational process. When these strategies are implemented from a coherent and sustained institutional perspective, they become a fundamental part of a more humane university culture.

Supporting medical students at risk of dropping out is an act of ethical commitment that profoundly challenges the role of the university and the teacher. It is not only a matter of preventing someone from abandoning their studies, but also of sustaining academic trajectories, nurturing vocational processes, and contributing to the strengthening of the health system from its educational foundation. The good practices identified in this study invite us to reflect on the importance of building environments that listen, accompany, and respond sensitively to the diverse realities of the student body.

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## FUNDING

This article is part of the research project “Intervention program for first-year medical students facing attrition and dropout” and “San Gregorio de Portoviejo University: Sustainable and healthy university community” of the medical program at San Gregorio de Portoviejo University.

## CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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*Visualization*: Lester Willian Loor Vines.

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