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MEDICINA DE PRECISIÓN: CIENCIA HECHA A TU MEDIDA

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Special Issue: Scientific Posters from the 12th International Congress on Health Research

The CIE Journal of Educational Research presents this special issue devoted to the publication of scientific posters selected from the 12th International Congress on Health Research, as a strategic editorial initiative aimed at strengthening the dissemination of scientific knowledge, consolidating early research training, and ensuring the academic traceability of scholarly work presented in university scientific forums. Research congresses represent privileged spaces for knowledge socialization, academic exchange, and formative evaluation of emerging projects. However, their true impact is achieved when research outcomes transcend the event itself and are formally integrated into the scientific publishing ecosystem. In this context, the publication of scientific posters in a peer-reviewed journal constitutes a fundamental bridge between research training and scholarly production with recognized editorial value, particularly within university settings.

The 12th International Congress on Health Research was distinguished by its high methodological rigor, interdisciplinary approach, and unprecedented student participation, achieving an acceptance rate of 98% following rigorous methodological and ethical review processes. The congress featured broad representation across research areas, including clinical sciences, medical education, public health, technological innovation, and basic science. The poster modality, which accounted for more than two-thirds of the accepted submissions, reflected the progressive scientific maturity of the authors and the consolidation of an institutional model of academic mentoring and research supervision.

This special issue brings together a curated selection of posters that were peer-reviewed and adapted to the journal's editorial format, while preserving their

essential scientific structure, methodological clarity, and relevance of findings. The editorial decision to grant visibility to this modality is grounded in the recognition that the scientific poster is not a secondary product, but rather a legitimate and rigorous form of scholarly communication, particularly relevant during the early stages of the research career.

From an editorial perspective, this publication serves multiple purposes: it formalizes the scientific production presented at the congress; acknowledges the academic efforts of students, advisors, and reviewers; promotes a culture of responsible and ethical publication; and strengthens the journal's positioning as an inclusive, formative, and quality-driven platform for scientific dissemination.

Furthermore, this special issue reaffirms the Journal of Educational Research's commitment to open science, the training of new generations of researchers, and the articulation of teaching, research, and innovation. In doing so, it contributes to the evolution of the presented projects toward full research articles, multicenter studies, or applied developments with social and clinical impact.

Finally, we acknowledge the work of the scientific, editorial, and organizing committees, as well as the academic advisors and reviewers, whose contributions were essential in ensuring the quality of the works published herein. This special issue not only documents a congress, but also bears witness to an active, critical, and engaged academic community committed to the generation of relevant knowledge, laying the groundwork for future editions and consolidating a model of university-based scientific dissemination with both national and international projection.

Sincerely
Miriam Janet Cervantes López, PhD
Editor-in-Chief



The empirical evaluation of game-based learning in medical education

Evaluación empírica del aprendizaje basado en juegos en educación médica

Rebeka Deneb Maya Pérez, Luz Elena Olivares Ferral, Dra. Sarahí González Reyes,
Dra. Miriam Janet Cervantes López, Dr. Ricardo Humberto Colmenares Díaz*

Abstract

Gamification has become an innovative strategy in medical education, promoting motivation and active learning. However, its improper application can lead to adverse effects by focusing on superficial aspects, such as point accumulation, without clear pedagogical objectives. At the Faculty of Medicine in Tampico, students face a high cognitive load due to the complexity of the content, highlighting the need to empirically evaluate the gamification components that influence the perceived effectiveness of learning. The objective of this study was to analyze the relationship between key elements of educational gamification, such as meaningful learning, challenge utility, ease of recall, and overall satisfaction, with the perceived effectiveness of learning in students at the Faculty of Medicine in Tampico. A descriptive-correlational, cross-sectional study was conducted with the participation of 250 students (aged 18-29) who had participated in gamified activities. A structured Likert-type questionnaire, validated by experts and tested in a pilot study, was used. Data analysis was performed using multiple linear regression with SPSS software. The results indicated that the perception of meaningful learning and overall satisfaction with gamified dynamics were the main predictors of the perceived effectiveness of gamified learning, explaining 67% of the total variance. These results suggest that gamification enhances motivation, comprehension, and content retention. This study reinforces the need to implement well-structured gamified practices aligned with clear pedagogical objectives

Keywords: educational gamification; medical education; perceived effectiveness; meaningful learning; gamified challenges

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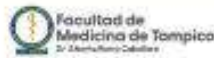
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Resumen

La gamificación se ha consolidado como una estrategia innovadora en la educación médica, favoreciendo la motivación y el aprendizaje activo. No obstante, su aplicación inapropiada puede generar efectos adversos al centrarse en aspectos superficiales, como la acumulación de puntos, sin objetivos pedagógicos claros. En la Facultad de Medicina de Tampico, los estudiantes enfrentan una alta carga cognitiva debido a la complejidad de los contenidos, lo que resalta la necesidad de evaluar empíricamente los componentes de gamificación que influyen en la eficacia percibida del aprendizaje. El objetivo de este estudio fue analizar la relación entre los elementos clave de la gamificación educativa, como el aprendizaje significativo, la utilidad de los retos, la facilidad de recuerdo y la satisfacción general, con la eficacia percibida del aprendizaje en estudiantes de la Facultad de Medicina de Tampico. Se realizó un estudio descriptivo-correlacional, transversal, con la participación de 250 estudiantes (de 18 a 29 años) que habían participado en actividades gamificadas. Se utilizó un cuestionario estructurado tipo Likert, validado por expertos y probado en un piloto. El análisis de los datos se realizó mediante regresión lineal múltiple con el software SPSS. Los resultados indicaron que la percepción de aprendizaje significativo y la satisfacción general con las dinámicas lúdicas fueron los principales predictores de la eficacia percibida del aprendizaje gamificado, explicando el 67% de la varianza total. Estos resultados sugieren que la gamificación mejora la motivación, comprensión y retención de contenidos. Este estudio refuerza la necesidad de implementar prácticas gamificadas bien estructuradas y alineadas con objetivos pedagógicos claros.

Palabras clave: gamificación educativa; educación médica; eficacia percibida; aprendizaje significativo; retos gamificados





The empirical evaluation of game-based learning in medical education

Maya Pérez Rebecka Deneb, Olivares Ferral Luz Elena, González Reyes Sarahi, Cervantes López Miriam Janet, Colmenares Díaz Ricardo Humberto

Facultad de Medicina "Dr. Alberto Romo Caballero"

INTRODUCTION

Do games truly enhance learning in medical education? At the Faculty of Medicine in Tampico, students face an intense academic workload, making it necessary to identify which game-based strategies are effective and which require reconsideration. This study analyzes four key elements of educational gamification—satisfaction, ease of use, perceived usefulness, and learning perception—with the aim of determining which ludic strategies most effectively enhance learning outcomes.

OBJETIVE

To determine which elements of educational gamification are associated with more effective learning among medical students by evaluating the impact of satisfaction with game-based dynamics, ease of recall, perceived usefulness, and learning perception.

METHODOLOGY

A quantitative, cross-sectional, and descriptive study with correlational analysis using multiple linear regression was conducted.

The sample included 109 third-year medical students from the Autonomous University of Tamaulipas (Tampico campus), who participated voluntarily and anonymously.

Data were collected using a 28-item digital Likert-type questionnaire (1–5) structured across four dimensions: meaningful learning, perceived usefulness, ease of recall, and satisfaction.

The instrument demonstrated expert-validated content validity and high internal consistency (Cronbach's $\alpha = 0.97$).

Data collection was performed via an online survey, and statistical analysis was conducted using SPSS to identify predictors of perceived effectiveness of gamified learning.

RESULTS

Multiple linear regression analysis showed that perceived meaningful learning and overall satisfaction with game-based dynamics were the primary predictors of the perceived effectiveness of gamified learning. These variables accounted for 67% of the total variance (Figure 1), suggesting that gamification enhances both comprehension and motivation among medical students.



Figure 1. Mean scores of the measured variables.

Table 1. Multiple linear regression analysis of the study variables.

Variable	Standardized Beta	Sig. (p)	Interpretation
Perception of meaningful learning	0.41	0.004	Significantly positive perceived efficacy
Usefulness of challenges	0.27	0.028	Also contributes, although with less weight
Ease of recall	0.09	0.215	Not significant
Overall satisfaction	0.33	0.008	Good predictor, positive influence

CONCLUSIONS

Game-based learning strategies strengthen active learning and student satisfaction. Gamification emerges as an effective educational tool for improving motivation, knowledge retention, and positive perceptions of the learning process in medical education.

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Clinical attitude of undergraduate medical students at the Faculty of Medicine “Dr. Alberto Romo Caballero” in Tamaulipas

Actitud clínica de los estudiantes de medicina de pregrado en la Facultad de Medicina “Dr. Alberto Romo Caballero” en Tamaulipas

Camila García Monroy, José Manuel Matías del Ángel, Juan de Dios Velázquez Martínez,
Dr. Guillermo Pedraza Rubio*

Abstract

Clinical attitude represents an internal disposition of a cognitive, affective, and behavioral nature that guides how medical students approach clinical scenarios, integrating elements such as perception of learning, motivation, empathy, ethics, communication, and teamwork. International evidence has shown that early exposure to clinical practice contributes to strengthening motivation, self-confidence, and professional security, whereas limited interaction with patients may be associated with anxiety and insecurity. In the Mexican context, there is a scarcity of studies that systematically analyze the evolution of clinical attitude throughout medical training. The objective of this study was to evaluate the clinical attitude of undergraduate medical students at the Faculty of Medicine “Dr. Alberto Romo Caballero” and to compare differences between those in basic cycles and those in clinical stages. An observational, cross-sectional, and analytical study was conducted with approximately 300 students using stratified sampling by semester. Data were collected using a clinical professionalism questionnaire with a five-point Likert scale, validated through expert judgment and a pilot test. Statistical analysis included descriptive statistics, reliability estimation, and group comparisons. The results demonstrated high instrument reliability ($\alpha \approx 0.90$). Students in the basic cycles showed slightly higher clinical attitude scores compared to those in the clinical cycles, with small but consistent differences. These findings suggest that the development of clinical attitude does not depend solely on curricular progression, highlighting the need to strengthen early and continuous training strategies focused on medical professionalism.

Keywords: clinical attitude; medical education; clinical professionalism; medical students; clinical training

Resumen

La actitud clínica representa una disposición interna de carácter cognitivo, afectivo y conductual que orienta la forma en que el estudiante de medicina se enfrenta a los escenarios clínicos, integrando elementos como la percepción del aprendizaje, la motivación, la empatía, la ética, la comunicación y el trabajo en equipo. La evidencia internacional ha demostrado que la exposición temprana a la práctica clínica contribuye al fortalecimiento de la motivación, la autoconfianza y la seguridad profesional, mientras que una limitada interacción con pacientes puede asociarse con ansiedad e inseguridad. En el contexto mexicano, son escasos los estudios que analizan de manera sistemática la evolución de la actitud clínica a lo largo de la formación médica. El objetivo del estudio fue evaluar la actitud clínica de los estudiantes de medicina de pregrado de la Facultad de Medicina “Dr. Alberto Romo Caballero” y comparar las diferencias entre quienes cursan los ciclos básicos y aquellos que se encuentran en etapas clínicas. Se llevó a cabo un estudio observacional, transversal y analítico en aproximadamente 300 estudiantes, mediante un muestreo estratificado por semestre. Para la recolección de datos se utilizó un cuestionario de profesionalismo clínico con escala Likert de cinco puntos, validado por juicio de expertos y prueba piloto. El análisis estadístico incluyó estadística descriptiva, estimación de confiabilidad y comparaciones entre grupos. Los resultados mostraron una alta confiabilidad del instrumento ($\alpha \approx 0.90$). Los estudiantes de ciclos básicos presentaron puntajes ligeramente superiores en actitud clínica en comparación con los estudiantes de ciclos clínicos, con diferencias pequeñas pero consistentes. Estos hallazgos sugieren que el desarrollo de la actitud clínica no depende únicamente del avance curricular, lo que resalta la necesidad de fortalecer estrategias formativas tempranas y continuas orientadas al profesionalismo médico.

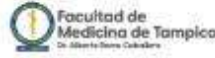
Palabras clave: actitud clínica; educación médica; profesionalismo clínico; estudiantes de medicina; formación clínica

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Clinical attitude of undergraduate medical students at the Faculty of Medicine “Dr. Alberto Romo Caballero” in Tamaulipas

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Facultad de Medicina de Tampico “Dr. Alberto Romo Caballero”

INTRODUCTION

Clinical attitude is an internal, emotional, and cognitive disposition that guides how medical students approach clinical scenarios. It encompasses cognitive aspects (perceived learning), affective components (motivation, empathy, and emotional regulation), and behavioral dimensions (ethics, communication, teamwork, and responsibility). International studies indicate that early exposure to clinical practice strengthens motivation, confidence, and professional security, whereas limited real patient contact may lead to anxiety, insecurity, or disengagement. In Mexico, however, there remains a paucity of research examining how clinical experience—from the initial semesters to hospital rotations—shapes the development of clinical attitudes.

OBJETIVE

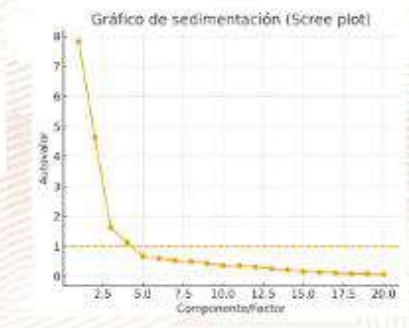
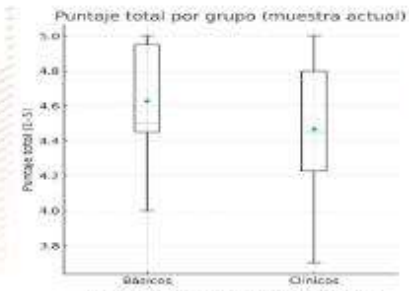
To evaluate the clinical attitudes of undergraduate medical students across all semesters at the Faculty of Medicine “Dr. Alberto Romo Caballero” and to compare differences between students with limited clinical exposure (preclinical stages) and those with greater hospital experience, in order to identify areas for improvement within the educational model.

METHODOLOGY

Study design: Observational, cross-sectional, and analytical. **Population and sample:** Undergraduate medical students enrolled in the Faculty of Medicine “Dr. Alberto Romo Caballero”; stratified sampling by semester (non-probabilistic convenience sampling), n = 300. **Instrument:** Clinical professionalism questionnaire (adapted from Meli et al., 2012) using a 1-5 Likert scale, assessing responsibility, respect, communication, ethics, and teamwork. **Validation:** Expert panel review and pilot testing (n=30 students); internal consistency estimated using Cronbach’s alpha (>0.80) and exploratory factor analysis. **Variables:** clinical/clinical professionalism. **Independent:** Semester (basic: 1st, 3rd, 5th, clinical: 7th-10th), hospital exposure, sex, age, social and communicative competencies (CLIMED subscales). **Procedure:** In-class and online administration with informed consent; anonymous participation and secure data capture. **Ethical considerations:** Declaration of Helsinki; minimal risk; strict confidentiality. **Statistical analysis (summary):** Descriptive statistics; reliability (α); validity (EFA); group comparisons (basic vs. clinical/by semester); associations between variables.

RESULTS

Proportions and internal consistency were preserved ($\alpha = 0.90$). Mean scores were similar across groups, with basic-cycle students showing slightly higher values ($M = 4.60 - 4.65$) than clinical-cycle students ($M = 4.46 - 4.43$). The difference was small but consistent ($p = 0.007 - 0.015$; $d = 0.32 - 0.48$), reinforcing the stability of the primary finding. Simulation to $n = 300$ maintained the observed pattern, suggesting robustness and practical utility for guiding early clinical training strategies.



CONCLUSIONS

The questionnaire demonstrates high reliability for assessing clinical attitude/professionalism among medical students. Students in basic cycles achieved slightly higher scores than those in clinical stages, with a small-to-moderate effect size. These findings indicate that the development of clinical attitudes is not determined solely by curricular progression and highlight the importance of early and continuous formative strategies focused on clinical professionalism.

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Diagnostic biomarkers in arterial hypertension in adult patients: a systematic review

Biomarcadores diagnósticos en hipertensión arterial en pacientes adultos: revisión sistemática

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Abstract

Systemic arterial hypertension constitutes a public health problem of high prevalence and substantial morbidity and mortality burden, which has driven the search for tools that enable early detection. In this context, serum biomarkers have gained relevance due to advances in molecular methods that allow their identification through specific proteins and metabolic and epigenetic markers. The objective of this systematic review was to describe the diagnostic potential of various serum biomarkers in adult patients with arterial hypertension, compare them with standard diagnostic methods, and analyze their usefulness in differentiating the distinct phases of the disease. A systematic review of studies published in databases such as PubMed, ScienceDirect, and EBSCO was conducted, selecting research involving patients over 18 years of age without a prior diagnosis of hypertension. The search was performed using MeSH terms and Boolean operators. Following the processes of identification, evaluation, and eligibility, six studies were included in the final analysis. The results showed that the plasma atherogenic index, the triglyceride–glucose index, and C-reactive protein exhibited significant values as predictors of the development of arterial hypertension, particularly in early stages, and were directly associated with risk factors such as dyslipidemia and obesity. However, these biomarkers did not surpass the diagnostic performance of conventional techniques. In conclusion, although certain biomarkers show promising potential for the early detection of arterial hypertension, their clinical use still requires further evidence to support their incorporation as standard diagnostic tools.

Palabras clave: biomarcadores séricos; hipertensión arterial; diagnóstico temprano; riesgo cardiovascular; revisión sistemática

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Resumen

La hipertensión arterial sistémica constituye un problema de salud pública de alta prevalencia y elevada carga de morbimortalidad, lo que ha motivado la búsqueda de herramientas que permitan su detección temprana. En este contexto, los biomarcadores séricos han adquirido relevancia debido a los avances en los métodos moleculares, que han permitido su identificación mediante proteínas específicas y marcadores metabólicos y epigenéticos. El objetivo de esta revisión sistemática fue describir el potencial diagnóstico de diversos biomarcadores séricos en pacientes adultos con hipertensión arterial, compararlos con los métodos diagnósticos estándar y analizar su utilidad para diferenciar las distintas fases de la enfermedad. Se realizó una revisión sistemática de estudios publicados en bases de datos como PubMed, ScienceDirect y EBSCO, seleccionando investigaciones en pacientes mayores de 18 años sin diagnóstico previo de hipertensión. La búsqueda se llevó a cabo utilizando términos MeSH y operadores booleanos. Tras el proceso de identificación, evaluación y elegibilidad, se incluyeron seis estudios para el análisis final. Los resultados mostraron que el índice aterogénico en plasma, el índice triglicéridos-glucosa y la proteína C reactiva presentaron valores significativos como predictores del desarrollo de hipertensión arterial, particularmente en fases tempranas, y se asociaron de manera directa con factores de riesgo como la dislipidemia y la obesidad. No obstante, estos biomarcadores no superaron la capacidad diagnóstica de las técnicas convencionales. En conclusión, aunque ciertos biomarcadores muestran un potencial prometedor para la detección temprana de hipertensión arterial, su uso clínico aún requiere mayor evidencia que respalde su incorporación como herramientas diagnósticas estándar.

Keywords: serum biomarkers; arterial hypertension; early diagnosis; cardiovascular risk; systematic review





Diagnostic biomarkers in arterial hypertension in adult patients: a systematic review

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INTRODUCTION

Biomarkers are precise diagnostic tools that have gained relevance with advances in molecular methods, enabling detection through specific proteins or epigenetic markers. Currently, several serum biomarkers associated with arterial hypertension (AH) have been described. Their implementation aims to achieve early diagnosis, thereby contributing to the timely management of this major public health problem.

OBJETIVE

To describe the diagnostic potential of serum biomarkers in hypertensive patients during early stages and throughout disease progression. To compare serum biomarkers with standard detection methods for arterial hypertension. To analyze the utility of biomarkers for differentiating stages of arterial hypertension.

METHODOLOGY

Studies conducted in adult patients (≥ 18 years) without a prior diagnosis of hypertension were selected. Information was retrieved from PubMed, ScienceDirect, and EBSCO, using MeSH terms and Boolean operators combined with relevant keywords. A systematic review methodology was applied.

RESULTS

Study identification and selection: Records were identified through database searches and registers. After removal of duplicates and screening, eligible reports were assessed, and eight studies met the inclusion criteria for the final review. Across the included studies, biomarkers such as the atherogenic index in plasma (AIP), triglyceride-glucose index (TyG), and C-reactive protein (CRP) showed significant associations with hypertension, particularly in early or intermediate stages. Several studies reported correlations between elevated biomarker levels and cardiovascular risk factors, including dyslipidemia and obesity.

Autores	Metodología	Conclusiones
Salazar & Zavala, 2024	Tipo de estudio: Observacional de casos y controles. Lugar del estudio: Querétaro. Muestra: 204 pacientes con hipertensión, grado 1 y 104 pacientes del grupo control. Tipo de estudio: casos y controles.	Los niveles elevados de ACPH, Verlebaescolina (VMA) están significativamente asociados con la hipertensión en etapas 1 y 2 en comparación con los controles. La Glicoproteína beta2-glicoproteína (β2GPI) se ha relacionado con la hipertensión en poblaciones de riesgo para la predicción preclínica de la hipertensión.
Abdel et al., 2023	Lugar del estudio: Qatar. Muestra: 224 sujetos con hipertensión (112 hombres y 112 mujeres). Tipo de estudio: casos y controles.	Este estudio descubrió 20 biomarcadores de proteínas significativos con asociación a hipertensión. Notablemente, CYP11B y HSP70 fueron identificadas como biomarcadores potenciales. El estudio se centró en vías críticas involucradas en la biología vascular, la respuesta del sistema inmunario, el metabolismo y el mantenimiento de arterias coronarias.
Shi et al., 2021	Tipo de estudio: Cohorte retrospectivo. Lugar del estudio: China. Muestra: De inclusión 6249 participantes, después 4264 permanecieron en estudio (68% completó el estudio). Tipo de estudio: casos y controles.	PCR sérica demostró asociación independiente a largo plazo con la hipertensión. El índice aterosclerótico en plasma (AIP) es un factor de riesgo independiente y significativo para desarrollar hipertensión. Descubrió biomarcos predictivos en los individuos individuales como triglicéridos y colesterol.
He et al., 2022	Tipo de estudio: casos y controles. Lugar del estudio: Singapur. Muestra: 136 pacientes de 65 años o más hospitalizados. Estos se dividieron en dos grupos según su nivel de Proteína C reactiva (PCR): un grupo con PCR elevada (103 personas) y un grupo con PCR normal (33 personas).	La prevalencia de hipertensión arterial en las arterias coronarias e infarto miocárdico anterior fue significativamente mayor en el grupo con PCR elevada. También hubo una asociación significativa entre el consumo de alcohol, el nivel de lipoproteínas de baja densidad (LDL) y los estrógenos y la PCR elevada para determinar la enfermedad. Tener la PCR elevada aumentó el riesgo de hipertensión hasta 2.51 veces.
Xie et al., 2021	Tipo de estudio: Cohorte. Lugar del estudio: Dalian, China. Muestra: 15,290 participantes de entre 18-82 años de hipertensión con seguimiento de 12 años.	Un índice TyG elevado al inicio y luego plazo se asociaron con riesgo de hipertensión. La identificación temprana de un índice TyG es un punto de intervención importante para prevenir la hipertensión en el futuro.
Rubiana et al., 2020	Tipo de estudio: casos y controles. Lugar del estudio: Venezuela. Muestra: 302 adultos mayores y 13 años divididos en dos grupos, 146 sin hipertensión y 156 hipertensos.	Las concentraciones plasmáticas de AIT, AST y GGT fueron significativamente más altas en el grupo de personas con hipertensión en comparación con el grupo de personas sin hipertensión. La prevalencia de tener al menos una o más enzimas hepáticas elevadas fue considerablemente mayor en el grupo con hipertensión (49.2%) en comparación con el grupo controlado (38.1%).

DISCUSSION

AIP, TyG, and CRP demonstrated significant predictive value for the development of arterial hypertension. These biomarkers are directly related to metabolic risk factors, suggesting their potential role in risk stratification and early detection, especially in populations with cardiometabolic comorbidities.

CONCLUSION

The atherogenic index in plasma, C-reactive protein, and the triglyceride-glucose index showed relevant associations with the detection of arterial hypertension. However, these biomarkers do not yet outperform standard diagnostic techniques, indicating the need for further studies to validate their clinical utility and integration into routine practice.

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Knowledge of research methodology in medical residents: a systematic review

Conocimientos en metodología de la investigación en residentes médicos: revisión sistemática

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Abstract

Research methodology constitutes a fundamental pillar in the training of medical residents, as it supports clinical practice grounded in scientific evidence and promotes the generation of knowledge. Nevertheless, multiple studies have reported persistent deficiencies in residents' methodological knowledge, particularly in areas such as statistics, study design, and critical appraisal, which limits their active participation in academic projects and scientific production. In recent years, structured teaching of Evidence-Based Medicine and the incorporation of innovative pedagogical models, such as the Master Adaptive Learner, have been shown to improve methodological competencies, increase academic satisfaction, and reduce professional burnout. The objective of this systematic review was to analyze the level of knowledge regarding research methodology among medical residents. To this end, a systematic review was conducted in accordance with the PRISMA 2020 statement, including studies published between 2015 and 2025 in databases such as PubMed, Scopus, Web of Science, SciELO, LILACS, and Google Scholar. Original studies evaluating knowledge, perceptions, or educational interventions related to research methodology in residency programs were selected, and a narrative synthesis and methodological quality assessment were performed. The results revealed significant deficiencies in residents' methodological knowledge at a global level, with low participation in systematic reviews and limited formal training in research. Structured educational interventions demonstrated positive effects on knowledge acquisition, academic satisfaction, and resilience. These findings reinforce the need to systematically integrate methodological training as a priority component of postgraduate medical education.

Keywords: research methodology; postgraduate medical education; medical residents; evidence-based medicine; research training

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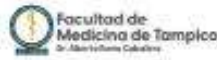
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Resumen

La metodología de la investigación constituye un pilar fundamental en la formación del médico residente, al sustentar la práctica clínica en la evidencia científica y favorecer la generación de conocimiento. No obstante, diversos estudios han señalado deficiencias persistentes en los conocimientos metodológicos de los residentes, particularmente en áreas como estadística, diseño de estudios y lectura crítica, lo que limita su participación en proyectos académicos y en la producción científica. En los últimos años, se ha documentado que la enseñanza estructurada de la Medicina Basada en Evidencias y la incorporación de modelos pedagógicos innovadores, como el Master Adaptive Learner, contribuyen a mejorar las competencias metodológicas, incrementar la satisfacción académica y reducir el agotamiento profesional. El objetivo de esta revisión sistemática fue analizar el nivel de conocimientos sobre metodología de la investigación en residentes médicos. Para ello, se realizó una revisión sistemática conforme a la declaración PRISMA 2020, incluyendo estudios publicados entre 2015 y 2025 en bases de datos como PubMed, Scopus, Web of Science, SciELO, LILACS y Google Scholar. Se seleccionaron estudios originales que evaluaron conocimientos, percepciones o intervenciones educativas relacionadas con metodología de la investigación en programas de residencia médica, realizándose una síntesis narrativa y valoración de la calidad metodológica. Los resultados evidenciaron deficiencias significativas en los conocimientos metodológicos de los residentes a nivel global, con baja participación en revisiones sistemáticas y limitada formación formal en investigación. Las intervenciones educativas estructuradas mostraron efectos positivos en el conocimiento, la satisfacción académica y la resiliencia. Estos hallazgos refuerzan la necesidad de integrar de manera sistemática la formación metodológica como componente prioritario de la educación médica de posgrado.

Palabras clave: metodología de la investigación; formación médica de posgrado; médicos residentes; medicina basada en la evidencia; formación en investigación





Knowledge of research methodology in medical residents: a systematic review

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INTRODUCTION

Research methodology constitutes a core pillar in medical residency training, as it ensures evidence-based clinical practice and fosters the generation of scientific knowledge. Nevertheless, significant deficiencies persist in areas such as statistics, study design, and critical appraisal, which limit residents' active participation in academic projects and scholarly publications. Recent evidence highlights that structured teaching of Evidence-Based Medicine and the incorporation of innovative pedagogical models such as the Master Adaptive Learner (MAL) strengthen methodological competencies, increase academic satisfaction, and reduce professional burnout. Integrating these strategies transversally across residency programs is essential to consolidate robust scientific training and to promote critical, ethical, and high-quality medical practice.

RESULTS

Medical residents exhibit significant gaps in methodological knowledge, particularly in statistics, study design, and critical reading. In Saudi Arabia, the mean knowledge score was 43%, while in Mexico only 12.5% of residents reported participation in systematic reviews. Structured educational interventions and pedagogical models such as the Master Adaptive Learner were associated with improvements in knowledge acquisition, academic satisfaction, and resilience (Figure 1). Despite these advances, global gaps and a lack of validated assessment instruments persist.



Figure 1 Master Adaptive Learner (MAL) Model

OBJETIVE

To analyze the level of knowledge in research methodology among medical residents through a systematic review of the literature.

METHODOLOGY

Study type: Systematic review conducted in accordance with the PRISMA 2020 statement. Databases: PubMed, Scopus, Web of Science, SciELO, LILACS, and Google Scholar. Time frame: 2015-2025. Eligibility criteria: Original studies assessing knowledge, perceptions, or educational interventions related to research methodology in residency programs. Analysis: Narrative synthesis of results and appraisal of methodological quality.

CONCLUSIONS

Methodological training during medical residency should be regarded as a structural and priority component of postgraduate medical education. Systematic integration of research methodology teaching through innovative strategies and validated assessments is necessary. Strengthening these competencies enhances academic quality, improves scientific productivity, and promotes a critical, ethical, and evidence-based medical practice...

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Perception of medical students on the use of clinical simulators in their practical training

Percepción de los estudiantes de medicina sobre el uso de simuladores clínicos en su formación práctica

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Abstract

Clinical simulation has been consolidated as an innovative strategy in medical education, as it allows the acquisition of skills in safe and controlled environments before direct contact with real patients. The objective of this study was to analyze students' perceptions of the use of clinical simulators and their impact on confidence during the performance of procedures. A cross-sectional, descriptive, and observational study was conducted with 146 students from the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero", selected through stratified non-probabilistic intentional sampling. A structured questionnaire with a Likert scale (1–5) was used, adapted and validated ($\alpha = 0.92$). Statistical analysis was performed using SPSS v25, applying descriptive statistics, Pearson correlation, and multiple linear regression. The results showed an overall positive perception (mean > 4.16), highlighting that clinical simulators promote theoretical-practical integration and the development of clinical reasoning. A significant association was identified between the dimensions of realism, usefulness, clinical reasoning, and curricular integration with clinical confidence ($p < 0.05$). The regression model was significant ($p < 0.001$) and explained 79% of the variance, with the main predictors being post-practice confidence ($B = 0.69$) and theory–practice integration ($B = 0.38$). In conclusion, clinical simulation represents a highly effective educational tool that strengthens confidence, improves decision-making, and contributes to safer and more competent medical training.

Palabras clave: clinical simulation; medical education; clinical confidence; clinical reasoning; experiential learning

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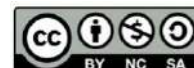
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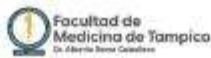
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Resumen

La simulación clínica se ha consolidado como una estrategia innovadora en la educación médica, al permitir la adquisición de habilidades en entornos seguros y controlados antes del contacto con pacientes reales. El objetivo del presente estudio fue analizar la percepción de los estudiantes sobre el uso de simuladores clínicos y su impacto en la confianza durante la realización de procedimientos. Se llevó a cabo un estudio transversal, descriptivo y observacional en 146 estudiantes de la Facultad de Medicina de Tampico "Dr. Alberto Romo Caballero", seleccionados mediante muestreo no probabilístico intencional estratificado. Se utilizó un cuestionario estructurado con escala tipo Likert (1–5), adaptado y validado ($\alpha=0.92$). El análisis estadístico se realizó con SPSS v25, empleando estadística descriptiva, correlación de Pearson y regresión lineal múltiple. Los resultados evidenciaron una percepción global positiva (media >4.16), destacando que los simuladores clínicos favorecen la integración teórico-práctica y el desarrollo del razonamiento clínico. Se identificó una asociación significativa entre las dimensiones de realismo, utilidad, razonamiento clínico e integración curricular con la confianza clínica ($p<0.05$). El modelo de regresión fue significativo ($p<0.001$) y explicó el 79% de la varianza, siendo los principales predictores la seguridad post-práctica ($B=0.69$) y la integración teoría-práctica ($B=0.38$). En conclusión, la simulación clínica representa una herramienta educativa altamente efectiva que fortalece la confianza, mejora la toma de decisiones y contribuye a una formación médica más segura y competente.

Keywords: simulación clínica; educación médica; confianza clínica; razonamiento clínico; aprendizaje experiencial





Perception of medical students on the use of clinical simulators in their practical training

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INTRODUCTION

Technological advancements have enhanced practical training in healthcare by creating controlled and safe environments, enabling students to acquire knowledge before direct patient contact. These include the use of high-fidelity physical simulators and virtual/augmented reality tools, which facilitate experiential learning, reduce risks, and contribute to improving safety, confidence, and care quality. Key evaluation methods highlight the importance of perceived effectiveness, utility, clinical reasoning, and curricular integration as determining factors for clinical confidence. Analyzing students' perceptions is a crucial factor in optimizing educational programs and strengthening the formation of future vocation-driven medical professionals.

OBJETIVE

General Objective: To analyze students' perceptions of using clinical simulators and their impact on confidence during clinical procedures.
Specific Objectives: 1) To determine the curricular integration of clinical simulators in the medical curriculum and its association with the perceived confidence of students. 2) To assess the impact of the perception of improvement in clinical reasoning on confidence in performing procedures.

METHODOLOGY

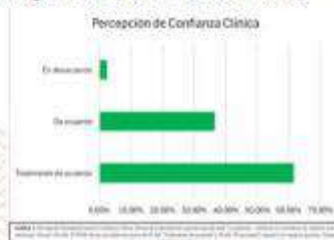
Design: Cross-sectional, descriptive, and observational study conducted at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero" with students having practical experience in clinical simulators.
Instrument: Structured Likert-type questionnaire adapted from the "Perception of undergraduate medical students of simulation workshops" (Villagrán et al., 2018).
Sample: 146 students selected through non-probabilistic intentional stratified sampling.
Data Collection: September–October 2025.
Analysis: Data processed with SPSS v25, using descriptive statistics, Pearson correlation, and multiple linear regression to identify the impact of perceptions (effectiveness, utility, clinical reasoning, and curricular integration) on clinical confidence. Significance level set at $p < 0.05$.

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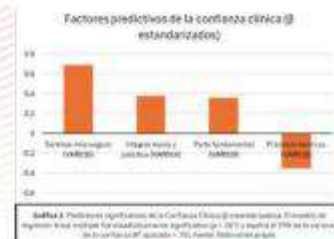
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RESULTS

The instrument was validated on 14 items with 146 students, and the Cronbach's alpha result was 0.92, showing consistency and reliability. The students' perception was positive, with an average score above 4.16. Notable results (Figure 1) included: "Workshops should be a mandatory component" (Mean = 4.82, SD = 0.45), "Simulation prepares better than exclusive clinical experience" (Mean = 4.73, SD = 0.45).



The measurement of the Pearson correlation scale concludes that the dimensions of Realism, Utility, Clinical Reasoning, and Theoretical-Practical Integration are statistically related ($p < 0.05$) to clinical confidence. The multiple linear regression model (Figure 2) was significant ($p < .001$) and explained 79% of the variance (adjusted $R^2 = .79$). The factors that best predict the increase in confidence are "Feeling more secure" ($B = 0.69$) and "Integrating theory and practice" ($B = 0.38$).



CONCLUSIONS

The results of the students' perception of the use of clinical simulators confirm that they are an effective educational tool for theoretical-practical integration. The linear regression model showed that post-practice confidence and theoretical-practical integration are the main factors that increase confidence and improve decision-making in medical students.

Relevant Burnout symptoms in second-semester medical students

Síntomas relevantes del Burnout en los estudiantes de segundo semestre de carrera de medicina

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Dr. Arturo Llanes Castillo*

Abstract

Academic burnout is a common syndrome among medical students, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, resulting from high academic workload and evaluative pressure. The objective of this study was to assess the relevant symptoms of burnout and analyze their relationship with perceived academic workload, self-efficacy, social support, and coping strategies in second-semester students. A cross-sectional, descriptive, and observational study was conducted with 148 students, using the Maslach Burnout Inventory–Student Survey (MBI-SS) along with social support (MSPSS) and coping (Brief-COPE) scales. Data were analyzed using SPSS through descriptive statistics, correlation analysis, and multivariate models. The results showed a significant prevalence of moderate-to-high emotional exhaustion in 42% of students, cynicism in 36%, and low academic efficacy in 18%. Perceived academic workload was the main positive predictor of burnout ($\beta = 0.39-0.42$), while self-efficacy and social support acted as protective factors. Functional coping strategies reduced burnout, unlike dysfunctional ones. The models explained between 37% and 48% of the variance. In conclusion, academic burnout appears from early stages of medical training, with academic workload as its main determinant. Self-efficacy and social support play a key protective role, highlighting the need to implement institutional strategies focused on student well-being.

Keywords: academic burnout; medical students; academic workload; self-efficacy; coping strategies

Resumen

El burnout académico es un síndrome frecuente en estudiantes de medicina, caracterizado por agotamiento emocional, despersonalización y baja realización personal, derivado de la alta carga académica y la presión evaluativa. El objetivo del estudio fue evaluar los síntomas relevantes del burnout y analizar su relación con la carga académica percibida, la autoeficacia, el apoyo social y las estrategias de afrontamiento en estudiantes de segundo semestre. Se realizó un estudio transversal, descriptivo y observacional en 148 estudiantes, utilizando el Maslach Burnout Inventory–Student Survey (MBI-SS) junto con escalas de apoyo social (MSPSS) y afrontamiento (Brief-COPE). El análisis se efectuó en SPSS mediante estadística descriptiva, correlacional y modelos multivariados. Los resultados mostraron una prevalencia significativa de agotamiento emocional moderado-alto en 42% de los estudiantes, cinismo en 36% y baja eficacia académica en 18%. La carga académica percibida fue el principal predictor positivo del burnout ($\beta=0.39-0.42$), mientras que la autoeficacia y el apoyo social actuaron como factores protectores. Las estrategias de afrontamiento funcionales redujeron el burnout, a diferencia de las disfuncionales. Los modelos explicaron entre el 37% y 48% de la varianza. En conclusión, el burnout académico se presenta desde etapas tempranas de la formación médica, siendo la carga académica su principal determinante. La autoeficacia y el apoyo social desempeñan un papel protector clave, lo que resalta la necesidad de implementar estrategias institucionales orientadas al bienestar estudiantil.

Palabras clave: burnout académico; estudiantes de medicina; carga académica; autoeficacia; afrontamiento

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Relevant Burnout symptoms in second-semester medical students

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INTRODUCTION

Academic burnout is common among medical students and manifests as emotional exhaustion, depersonalization, and low personal accomplishment, resulting from high academic workload, evaluative pressure, and limited institutional support. This syndrome affects psychological well-being, motivation, and performance, compromising the quality of medical education. In Mexico, evidence regarding its occurrence in early stages is limited. This study aims to identify the symptoms of burnout and analyze its relationship with academic workload, self-efficacy, social support, and coping strategies in second-semester medical students at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero."

OBJETIVE

Evaluate the relevant symptoms of academic burnout and analyze their relationship with perceived academic workload, self-efficacy, social support, and coping strategies in second-semester medical students at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero", through the application of the Maslach Burnout Inventory (MBI-SS) and statistical analysis in SPSS. Specifically, the study aims to describe the frequency and intensity of symptoms, and examine the association between the mentioned variables to identify predictive factors of academic burnout.

METHODOLOGY

Design: Cross-sectional, descriptive, and observational study. Sample: 148 second-semester medical students.

Instrument: Maslach Burnout Inventory–Student Survey (MBI-SS), 22 items, measuring three dimensions (global Cronbach's alpha = 0.70), perceived stress, self-efficacy, social support (MSPSS), and coping strategies (Brief-COPE).

Data Collection: February–March 2025, in-person administration.

Analysis: SPSS, applying descriptive statistics, correlation analysis, and multivariate models to identify predictors of burnout. Informed consent, anonymity, and ethical approval were ensured, considering the research as minimal risk in accordance with institutional bioethics guidelines.

RESULTS

Sample: 64% women and 36% men, with a mean age of 19.6 ± 1.1 years.

Relevant dimensions:

- **Emotional Exhaustion:** Moderate to high levels of emotional exhaustion were observed in 42% of participants, and cynicism was present in 36%, while 18% showed low academic efficacy. The applied scales demonstrated high internal consistency ($\alpha = 0.78-0.91$), supporting the reliability of the instruments used.

Multiple regression models indicated that perceived academic workload was the main positive predictor of burnout ($\beta = 0.39-0.42$), while academic self-efficacy and social support acted as protective factors (negative β values). Additionally, functional coping strategies reduced burnout levels, in contrast to dysfunctional strategies, which increased cynicism. The models explained between 37% and 48% of the total variance. These findings confirm the early presence of academic burnout in medical students.

Variable	n	Media	DE	Mín	Máx
Cansancio emocional	148	3.94	1.12	1.20	6.00
Desempeño depersonalizado	148	5.12	1.05	0.90	6.80
Eficacia académica	148	2.45	0.97	0.20	4.70
Índice global de Burnout	148	0.00	0.97	-1.80	2.95
Carga académica percibida	148	3.05	0.82	1.50	5.00
Autoeficacia académica	148	4.12	0.74	2.90	5.00
Apoyo social percibido	148	4.56	0.86	2.20	6.00
Afrontamiento funcional	148	3.89	0.61	2.30	5.00
Afrontamiento disfuncional	148	2.41	0.57	1.50	4.00

Table 1. (Own Authorship): Means and Standard Deviations of the Main Variables.

CONCLUSIONS

The study confirms that academic burnout significantly affects medical students from the early semesters, with academic workload being the main determinant of the syndrome, in line with previous research. The results support the conservation of resources theory, where an excess of demands without compensatory resources (such as self-efficacy and social support) precipitates exhaustion. Academic self-efficacy showed the strongest protective effect, reducing exhaustion and cynicism, consistent with the findings of Ye (2021) and Angelopoulos et al., who highlight its mediating role between stress and burnout.

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Self-perception of general clinical competencies in medical students during their hospital internships: a descriptive cross-sectional study

Autopercepción de competencias clínicas generales en estudiantes de medicina durante sus prácticas hospitalares: un estudio descriptivo transversal

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Abstract

The self-perception of clinical competencies in medical students may be influenced by contextual factors that generate insecurity in decision-making and patient interaction. Given the limited local evidence, the objective of this study was to evaluate students' self-perception of clinical skills and hospital performance, as well as to analyze associated factors such as emotional intelligence, self-efficacy, stress management, and institutional characteristics. A quantitative, descriptive, cross-sectional, and observational study was conducted among medical students during hospital internships in southern Tamaulipas (Tampico, Madero, and Altamira), using a structured 47-item Likert-type questionnaire grouped into different domains. The instrument was applied to a sample of 162 participants selected through non-probabilistic convenience sampling. Data analysis was performed using SPSS under ethical standards of confidentiality and informed consent. The results showed a high self-perception of clinical competencies, soft skills, emotional intelligence, and academic self-efficacy, with more than 70% of responses at the highest level of the scale. However, stress management showed greater variability at intermediate levels. In conclusion, students perceive themselves as prepared for the clinical environment; however, it is necessary to strengthen emotional regulation and stress management strategies to promote overall well-being and professional performance.

Keywords: clinical competencies; self-perception; medical students; hospital internships; emotional intelligence

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Resumen

La autopercepción de las competencias clínicas en estudiantes de medicina puede verse influida por factores contextuales que generan inseguridad en la toma de decisiones y en la interacción con los pacientes. Ante la escasa evidencia local, el objetivo del estudio fue evaluar la autopercepción de las habilidades clínicas y el desempeño hospitalario, así como analizar factores asociados como la inteligencia emocional, la autoeficacia, el manejo del estrés y las características institucionales. Se realizó un estudio cuantitativo, descriptivo, transversal y observacional en estudiantes de medicina en prácticas hospitalarias en la zona sur de Tamaulipas (Tampico, Madero y Altamira), mediante una encuesta estructurada tipo Likert de 47 ítems, agrupados en distintos dominios, aplicada a una muestra de 162 participantes seleccionados por muestreo no probabilístico por conveniencia. El análisis se realizó en SPSS bajo criterios éticos de confidencialidad y consentimiento informado. Los resultados mostraron una autopercepción elevada en competencias clínicas, habilidades blandas, inteligencia emocional y autoeficacia académica, con más del 70% de respuestas en el nivel más alto de la escala. Sin embargo, el manejo del estrés presentó mayor variabilidad en niveles intermedios. En conclusión, los estudiantes se perciben preparados para el entorno clínico; no obstante, es necesario fortalecer estrategias de regulación emocional y manejo del estrés para favorecer su bienestar integral y desempeño profesional.

Palabras clave: competencias clínicas; autopercepción; estudiantes de medicina; prácticas hospitalarias; inteligencia emocional





Self-perception of general clinical competencies in medical students during their hospital internships: a descriptive cross-sectional study

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INTRODUCTION

Self-perception of clinical competencies may be influenced by contextual factors that generate insecurity in decision-making and patient interaction. However, there is limited local evidence regarding the influence of these factors on self-perception of clinical performance. In response to this gap, the present descriptive and cross-sectional study aims to characterize the self-perception of general clinical competencies in students performing hospital internships in the southern region of Tamaulipas (Tampico, Madero, and Altamira).

OBJETIVE

GENERAL OBJECTIVE

To evaluate the self-perception of medical students regarding their clinical skills and performance in the hospital setting during their internships in hospitals in the southern region of Tamaulipas.

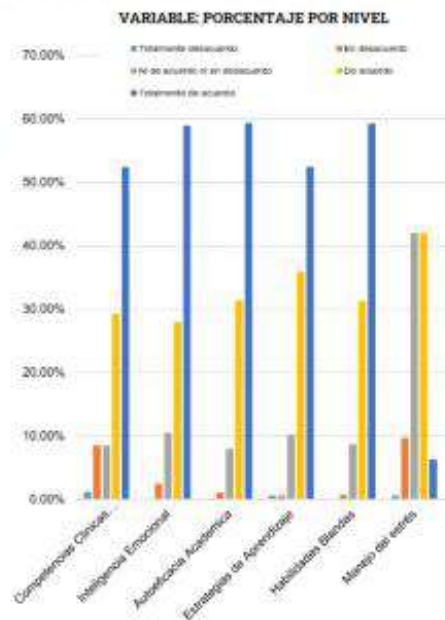
SPECIFIC OBJECTIVES:

- To identify the general clinical skills that students believe they have developed during their hospital internships in the southern region of Tamaulipas.
- To analyze the level of confidence that students have in their clinical performance within the hospital setting.
- To evaluate the emotional intelligence level of health sciences students during their clinical internships.
- To identify institutional, academic, or personal factors that influence the self-perception of hospital performance.
- To explore the differences in self-perception based on the type of hospital (public, private, general, specialized) where the internships take place.

METHODOLOGY

- It is a descriptive, cross-sectional, quantitative, observational, and non-experimental study, based on a structured Likert-type survey applied to medical students in hospital internships in Tampico, Ciudad Madero, and Altamira.
- The instrument application was coordinated with the heads of education from each participating hospital, both public and private, and surveys were administered at centers that authorized data collection.
- A non-probabilistic convenience sampling was planned, with a sample size of 162 participants calculated; the inclusion, exclusion, and elimination criteria were defined in the protocol.
- The instrument consists of 47 items grouped into the following domains: self-perception of general clinical competencies, emotional intelligence, academic self-efficacy, learning strategies, soft skills, and stress management. Responses were coded from 1 to 5 for processing in SPSS.
- The study adheres to the ethical standards outlined in the protocol, with informed consent and measures of anonymity and confidentiality.
- The results presented are provisional; the research is still in the process of data collection and analysis to fully evaluate the population of students in the southern region of Tamaulipas. Therefore, final conclusions will be issued once the comprehensive evaluation is completed.

RESULTS



CONCLUSIONS

The evaluated medical students showed a high self-perception of clinical competencies, soft skills, emotional intelligence, and academic self-efficacy, with more than 70% of responses at the highest level of the Likert scale. This suggests that they feel prepared to face real hospital scenarios and collaborate effectively in healthcare teams. However, stress management showed greater variability at intermediate levels, indicating the need to strengthen emotional self-regulation strategies within the clinical curriculum to promote the overall well-being of students.

REFERENCES



Effects of game-based university mentoring on motivation for self-care in overweight high school students: a systematic review

Efectos de la mentoría universitaria basada en el juego sobre la motivación hacia el autocuidado en estudiantes de bachillerato con sobrepeso: una revisión sistemática

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Abstract

Overweight and obesity among high school students represent a significant public health problem in Mexico, where more than 40% of adolescents are affected by these conditions. During this stage, increased autonomy in food choices and decreased physical activity contribute to weight gain; therefore, the development of self-care habits depends largely on personal motivation rather than mere access to information. In this context, peer university mentoring and game-based educational strategies have emerged as innovative alternatives to strengthen student engagement and active participation. The objective of this study was to systematically review the scientific literature on the effectiveness of game-based university mentoring in promoting motivation for self-care among overweight high school students, compared with other educational support strategies. A systematic literature review was conducted in accordance with PRISMA guidelines, using international databases and key terms related to obesity, games, mentoring, and personal motivation. The results showed that gamification had a positive effect on motivation toward physical activity, with competitive components being the most effective (85%), followed by social support (75%) and group collaboration (70%). These findings suggest that game-based university mentoring is a promising strategy for fostering self-care habits and healthy lifestyles in adolescents; however, further research is needed to define the optimal conditions for its implementation in the school setting.

Keywords: university mentoring; educational gamification; self-care; overweight and obesity; adolescent motivation

Resumen

El sobrepeso y la obesidad en estudiantes de bachillerato representan un problema de salud pública relevante en México, donde más del 40 % de los adolescentes presentan estas condiciones. Durante esta etapa, el incremento en la autonomía para la elección de alimentos y la disminución de la actividad física favorecen el aumento de peso, por lo que el desarrollo de hábitos de autocuidado depende en gran medida de la motivación personal más que del acceso a información. En este contexto, la mentoría universitaria entre pares y las estrategias educativas basadas en el juego han surgido como alternativas innovadoras para fortalecer el compromiso y la participación activa de los estudiantes. El objetivo de este estudio fue revisar sistemáticamente la literatura científica sobre la efectividad de la mentoría universitaria basada en el juego para promover la motivación hacia el autocuidado en estudiantes de bachillerato con sobrepeso, en comparación con otras estrategias de acompañamiento educativo. Se realizó una revisión bibliográfica sistemática conforme a las directrices de la declaración PRISMA, utilizando bases de datos internacionales y términos clave relacionados con obesidad, juegos, mentoría y motivación personal. Los resultados mostraron que la gamificación tuvo un efecto positivo en la motivación hacia la actividad física, destacando los componentes competitivos como los más eficaces (85 %), seguidos del apoyo social (75 %) y la colaboración grupal (70 %). Estos hallazgos sugieren que la mentoría universitaria basada en el juego es una estrategia prometedora para fomentar hábitos de autocuidado y estilos de vida saludables en adolescentes, aunque se requiere mayor investigación para definir las condiciones óptimas de su implementación en el ámbito escolar.

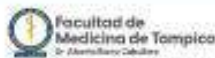
Palabras clave: mentoría universitaria; gamificación educativa; autocuidado; sobrepeso y obesidad; motivación en adolescentes

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Effects of game-based university mentoring on motivation for self-care in overweight high school students: a systematic review

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INTRODUCTION

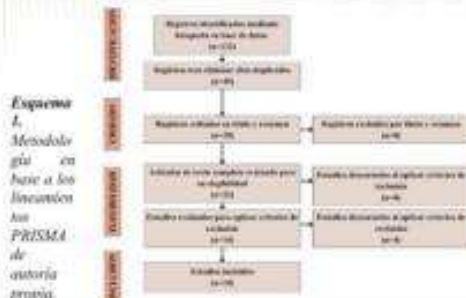
In Mexico, more than 40% of high school students are affected by overweight or obesity. During this stage, adolescents gain greater autonomy in their food choices and tend to reduce their level of physical activity, which increases the risk of weight gain. The development of self-care habits depends strongly on motivation, not solely on access to information. Peer mentoring and game-based strategies can increase participation, foster a sense of competence, and enhance personal commitment, thereby facilitating the sustained adoption of healthy behaviors.

OBJETIVE

To systematically review the scientific literature on the effectiveness of game-based university mentoring in promoting motivation toward self-care among overweight high school students, compared with other educational support strategies.

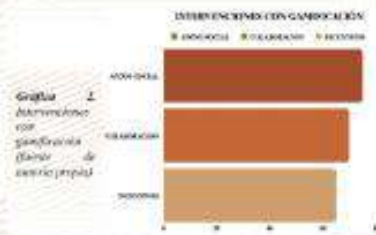
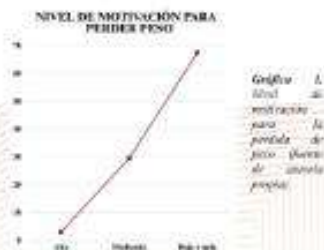
METHODOLOGY

The present study was conducted as a systematic bibliographic review following the guidelines of the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The research search strategy focused on the following keywords: Obesity, Overweight, Metabolic syndrome, Games, Mentoring, Personal motivation, Habits



RESULTS

Gamification demonstrated a positive effect on motivation toward physical activity. Competitive components were the most effective (85%), followed by social support (75%) and group collaboration (70%). These findings confirm the usefulness of gamification as an innovative strategy to promote healthy habits among adolescents.



CONCLUSIONS

Evidence indicates that overweight and obesity among high school students require strategies that strengthen motivation toward self-care beyond simply providing information. University mentoring that incorporates game elements represents a promising approach, as it promotes participation and peer support. When properly designed, it can improve adherence to healthy habits and encourage sustainable lifestyles. However, further research is still required to determine the conditions that optimize its effectiveness within school settings.

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Evaluation of mindful attention using the MAAS scale in medical students at academic risk

Evaluación de la atención consciente mediante la escala MAAS en estudiantes de medicina en situación de riesgo académico

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Abstract

Academic stress is a common problem among medical students and is associated with anxiety, depression, and burnout syndrome, which negatively affect academic performance and clinical empathy. In this context, mindfulness has been shown to be an effective strategy for reducing stress and improving emotional regulation. The Mindful Attention Awareness Scale (MAAS) is a validated instrument that assesses mindful attention and its relationship with psychological well-being, serving as a useful tool for identifying students at risk of academic vulnerability. The objective of this study was to evaluate mindful attention using the MAAS and to analyze its relationship with academic risk among medical students at the Autonomous University of Tamaulipas, as well as to explore its association with variables such as sex and academic semester. An observational, descriptive, and cross-sectional study was conducted in a sample of 47 medical students identified as being at academic risk. Data collection was carried out in person between April and May 2023 using the 15-item MAAS. Statistical analysis included descriptive and correlational statistics, as well as an assessment of the instrument's reliability using Cronbach's alpha coefficient. The results showed a mean total MAAS score of 66.68, with a normal distribution and high internal consistency of the instrument ($\alpha = 0.885$). Most students exhibited high or moderate levels of mindful attention; however, a subgroup with low levels was identified, suggesting the need to implement preventive strategies aimed at strengthening mindfulness to improve well-being and academic performance.

Keywords: mindful attention; mindfulness; medical students; academic risk; psychological well-being

Resumen

El estrés académico es un problema frecuente entre los estudiantes de medicina y se asocia con ansiedad, depresión y síndrome de burnout, lo que repercute negativamente en el rendimiento académico y en la empatía clínica. En este contexto, el mindfulness ha demostrado ser una estrategia eficaz para reducir el estrés y mejorar la regulación emocional. La escala Mindful Attention Awareness Scale (MAAS) es un instrumento validado que permite evaluar la atención consciente y su relación con el bienestar psicológico, constituyéndose como una herramienta útil para identificar estudiantes en situación de vulnerabilidad académica. El objetivo del estudio fue evaluar la atención consciente mediante la escala MAAS y analizar su relación con el riesgo académico en estudiantes de medicina de la Universidad Autónoma de Tamaulipas, así como explorar su asociación con variables como sexo y semestre académico. Se realizó un estudio observacional, descriptivo y transversal en una muestra de 47 estudiantes de medicina en situación de riesgo académico. La recolección de datos se llevó a cabo de manera presencial entre abril y mayo de 2023, utilizando la escala MAAS de 15 ítems. El análisis estadístico incluyó estadística descriptiva y correlacional, así como la evaluación de la confiabilidad del instrumento mediante el coeficiente alfa de Cronbach. Los resultados mostraron una media de 66.68 puntos en el puntaje total del MAAS, con una distribución normal y una alta consistencia interna del instrumento ($\alpha = 0.885$). La mayoría de los estudiantes presentó niveles altos o medios de atención consciente; sin embargo, se identificó un subgrupo con niveles bajos, lo que sugiere la necesidad de implementar estrategias preventivas orientadas al fortalecimiento del mindfulness para mejorar el bienestar y el desempeño académico.

Palabras clave: atención consciente; mindfulness; estudiantes de medicina; riesgo académico; bienestar psicológico

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Evaluation of mindful attention using the MAAS scale in medical students at academic risk

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Institución: Facultad de Medicina de Tampico "Dr. Alberto Romo Caballero" de la Universidad Autónoma de Tamaulipas

INTRODUCTION

Academic stress is a common problem among medical students and is frequently associated with anxiety, depression, and burnout syndrome, negatively affecting academic performance and clinical empathy. Mindfulness has demonstrated effectiveness in reducing stress and improving emotional regulation. The Mindful Attention Awareness Scale (MAAS) is a validated instrument designed to measure mindfulness and its impact on psychological well-being. Assessing mindfulness through the MAAS allows the identification of effective strategies to promote mental health and academic performance among future physicians.

OBJECTIVE

To evaluate mindful attention using the Mindful Attention Awareness Scale (MAAS) and its relationship with academic risk among medical students at the Universidad Autónoma de Tamaulipas. Additionally, the study aimed to: Measure levels of mindful attention among students at academic risk. Analyze the association between mindful attention and variables such as sex and academic semester.

METHODOLOGY

Design: Observational, descriptive, and cross-sectional study
Sample: 47 medical students at academic risk (≥ 18 years old)
Instrument: Mindful Attention Awareness Scale (MAAS), consisting of 15 items
Data collection: Conducted between April and May 2023, through in-person administration
Statistical analysis: Descriptive and correlational statistics were performed using SPSS. Instrument reliability was assessed using Cronbach's alpha.

CONCLUSIONS

The findings indicate that although a considerable proportion of students at academic risk present adequate or high levels of mindful attention, there is a vulnerable subgroup ($\approx 11\%$) with low mindfulness levels. According to the literature, this condition may be associated with: Greater academic distress, Lower emotional regulation, Increased distraction behaviors, such as excessive social media use, Poorer academic performance. These results highlight the importance of implementing mindfulness-based strategies to support mental health and academic functioning in medical students.

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RESULTS

Mindful attention scores were analyzed in 47 medical students at academic risk. The total MAAS score showed: Mean: 66.68 points Standard deviation: 13.40 Range: 43–88 points

The Shapiro–Wilk normality test showed a non-significant result ($W = 0.954$, $p = 0.062$), indicating that the assumption of normality for the total MAAS score distribution cannot be rejected.

The internal consistency of the instrument was high, with a Cronbach's alpha of 0.885, demonstrating adequate reliability for use in students at academic risk. Regarding mindfulness levels: High level: 46.81% Moderate level: 42.55% Low level: 10.64%. Figure 1.

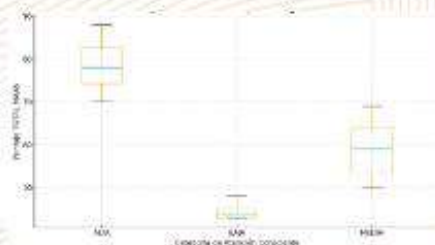


Figure 1. Total MAAS score by category

Category-based statistical analysis showed expected differences: High level: Mean = 78.68 (SD = 5.63) Moderate level: Mean = 59.00 (SD = 6.45) Low level: Mean = 44.60 (SD = 2.07).

Prevalence of self-medication among health sciences students at the Autonomous University of Tamaulipas, Campus Sur

Prevalencia de automedicación en estudiantes de ciencias de la salud de la Universidad Autónoma
de Tamaulipas, Campus Sur

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Abstract

Self-medication constitutes a common practice among university students in the health sciences and tends to intensify during academic examination periods. Factors such as stress, sleep deprivation, accessibility to medications, and the confidence derived from pharmacological knowledge contribute to its prevalence. Although this behavior is often perceived as a form of self-care, it entails clinical, ethical, and social risks, particularly when carried out without professional supervision, making it a relevant issue within the university setting. The objective of this study was to identify the prevalence of self-medication among health sciences students at the Autonomous University of Tamaulipas, Campus Sur, as well as to analyze the frequency of medication use, the conditions motivating this practice, and its distribution according to age, gender, and academic semester. A basic, epidemiological, cross-sectional, and descriptive study was conducted using a survey design applied to a probabilistic sample of 86 students randomly selected by semester from an approximate population of 800 students. The instrument consisted of a validated digital questionnaire ($\alpha = 0.886$), distributed through QR codes and institutional platforms. Data analysis was performed using descriptive statistics with SPSS software. The results revealed a high prevalence of self-medication, particularly among women, in the 21–24-year age group, and among students in clinical semesters. Analgesics and antihistamines were the most frequently used drugs; however, unsupervised use of antibiotics, anxiolytics, and supplements was also identified. The main reason for self-medication was disease management, followed by academic performance and emotional state, highlighting the need for preventive strategies aimed at promoting responsible medication use in the university environment.

Keywords: self-medication; health sciences students; prevalence; medication use; university health

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Resumen

La automedicación constituye una práctica frecuente entre los estudiantes universitarios de ciencias de la salud y tiende a intensificarse durante los periodos de evaluación académica. Factores como el estrés, la privación del sueño, la accesibilidad a medicamentos y la confianza derivada del conocimiento farmacológico favorecen su prevalencia. Aunque esta conducta suele percibirse como una forma de autocuidado, implica riesgos clínicos, éticos y sociales, particularmente cuando se realiza sin supervisión profesional, lo que la convierte en un problema relevante dentro del ámbito universitario. El objetivo del estudio fue identificar la prevalencia de automedicación en estudiantes de ciencias de la salud de la Universidad Autónoma de Tamaulipas, Campus Sur, así como analizar la frecuencia de uso de medicamentos, las condiciones que motivan esta práctica y su distribución según edad, género y semestre académico. Se llevó a cabo un estudio básico, epidemiológico, transversal y descriptivo, mediante un diseño de encuesta aplicada a una muestra probabilística de 86 estudiantes seleccionados aleatoriamente por semestre, a partir de una población aproximada de 800 alumnos. El instrumento consistió en un cuestionario digital validado ($\alpha = 0.886$), distribuido a través de códigos QR y plataformas institucionales. El análisis se realizó mediante estadística descriptiva con el software SPSS. Los resultados evidenciaron una alta prevalencia de automedicación, especialmente en mujeres, en el grupo de edad de 21 a 24 años y en semestres clínicos. Los analgésicos y antihistamínicos fueron los fármacos más utilizados, aunque también se identificó el uso no supervisado de antibióticos, ansiolíticos y suplementos. El principal motivo de automedicación fue el manejo de enfermedades, seguido del rendimiento académico y el estado emocional, lo que subraya la necesidad de estrategias preventivas dirigidas a promover el uso responsable de medicamentos en el entorno universitario.

Palabras clave: automedicación; estudiantes de ciencias de la salud; prevalencia; uso de medicamentos; salud universitaria



Prevalence of self-medication among health sciences students at the Autonomous University of Tamaulipas, Campus Sur
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INTRODUCTION

Self-medication is a frequent practice among university students in health sciences, particularly during periods of academic evaluation. Factors such as stress, sleep deprivation, accessibility to medications, and confidence derived from pharmacological knowledge contribute to its prevalence. Although often perceived as a form of self-care, this behavior entails clinical, ethical, and social risks, making its study relevant for the development of preventive strategies within university environments.

OBJECTIVE

General Objective

To identify the prevalence of self-medication among health sciences students at the Autonomous University of Tamaulipas, South Campus.

Specific Objectives

- To identify the frequency of the most commonly used medications.
- To determine the frequency of self-medication according to semester, age, and gender.
- To identify the main conditions that motivate self-medication.

METHODOLOGY

Study design: Basic epidemiological study, cross-sectional and descriptive

Population and sample: The study population consisted of approximately 800 health sciences students from the Faculty of Medicine "Dr. Alberto Romo Caballero" at the Autonomous University of Tamaulipas (South Campus). A probabilistic sample of 86 students was randomly selected by semester

Instrument: A digital questionnaire created in Microsoft Forms, validated with Cronbach's alpha = 0.886, was distributed through QR codes placed throughout the faculty and via official WhatsApp groups. Electronic informed consent was obtained before participation

Data analysis: Data were analyzed using descriptive statistics in SPSS version 27. Data normality was assessed using the Kolmogorov-Smirnov test ($p = 0.001$)

Inclusion criteria: Active students enrolled in health sciences programs who voluntarily agreed to participate

Exclusion criteria: Students who did not provide informed consent or who were not enrolled in health sciences programs.

RESULTS



CONCLUSIONS

Self-medication is a common practice among health sciences students, especially in advanced academic stages. While analgesics and antihistamines were the most frequently used medications, the unsupervised use of antibiotics and psychotropic drugs raises concerns. The higher prevalence among women and students aged 21-24 years, as well as its association with academic pressure, highlights the need for preventive educational interventions and responsible medication-use strategies within university settings.

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Osteoporotic fractures associated with prolonged use of proton pump inhibitors in the geriatric population: a systematic review

Fracturas osteoporóticas asociadas al uso prolongado de inhibidores de la bomba de protones en población geriátrica: revisión sistemática

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Abstract

Proton pump inhibitors (PPIs) are widely used medications for the treatment of acid-related disorders; however, their prolonged use in the geriatric population has been associated with adverse effects on bone metabolism. Chronic suppression of gastric acid may interfere with the absorption of nutrients essential for bone health, which, together with age-related physiological changes, polypharmacy, and the presence of osteoporosis, increases the risk of fragility fractures. The objective of this systematic review was to identify the most frequent fractures associated with prolonged PPI use in older adults with osteoporosis and to analyze the relationship between treatment duration and fracture risk. A systematic review was conducted in accordance with the PRISMA 2020 guidelines, using databases such as PubMed, Scopus, Web of Science, and ScienceDirect. Following the screening process, nine studies published between 2019 and 2025 were included, and odds ratios, relative risks, and hazard ratios were analyzed. The results demonstrated a consistent association between prolonged PPI use and an increased risk of osteoporotic fractures, particularly hip and vertebral fractures. The risk was higher with exposures of 12 months or longer, in postmenopausal women, and in patients with comorbidities or concomitant treatments. These findings support the need to critically evaluate the indication and duration of PPI therapy in older adults at risk of osteoporosis.

Keywords: osteoporotic fractures; proton pump inhibitors; osteoporosis; older adults; systematic review

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Resumen

Los inhibidores de la bomba de protones (IBP) son fármacos ampliamente utilizados para el tratamiento de enfermedades ácido-pépticas; sin embargo, su uso prolongado en la población geriátrica se ha asociado con efectos adversos sobre el metabolismo óseo. La supresión crónica del ácido gástrico puede interferir con la absorción de nutrientes esenciales para la salud ósea, lo que, aunado a los cambios fisiológicos del envejecimiento, la polifarmacia y la presencia de osteoporosis, incrementa el riesgo de fracturas por fragilidad. El objetivo de esta revisión sistemática fue identificar las fracturas más frecuentes asociadas al uso prolongado de IBP en adultos mayores con osteoporosis y analizar la relación entre la duración del tratamiento y el riesgo de fractura. Se realizó una revisión sistemática conforme a las directrices PRISMA 2020, utilizando bases de datos como PubMed, Scopus, Web of Science y ScienceDirect. Tras el proceso de cribado, se incluyeron nueve estudios publicados entre 2019 y 2025, analizándose razones de momios, riesgos relativos y razones de riesgo. Los resultados mostraron una asociación consistente entre el uso prolongado de IBP y un mayor riesgo de fracturas osteoporóticas, especialmente de cadera y columna vertebral. El riesgo fue mayor en exposiciones iguales o superiores a 12 meses, en mujeres posmenopáusicas y en pacientes con comorbilidades o tratamientos concomitantes. Estos hallazgos respaldan la necesidad de evaluar de forma crítica la indicación y duración del tratamiento con IBP en adultos mayores con riesgo osteoporótico.

Palabras clave: fracturas osteoporóticas; inhibidores de la bomba de protones; osteoporosis; adultos mayores; revisión sistemática



From gene to therapy: clinical utility of the BRCA1/BRCA2 genetic panel in precision medicine for breast cancer in Mexico

Del gen a la terapia: utilidad del panel genético BRCA1/BRCA2 en la medicina de precisión para el cáncer de mama en México

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Abstract

Breast cancer represents a priority public health challenge in Mexico, as it is the leading cause of cancer-related mortality among women. This scenario has driven the transition from generalized therapeutic approaches toward precision medicine, which tailors prevention and treatment to individual genomic characteristics. In this context, germline mutations in the BRCA1 and BRCA2 genes have been identified as the most relevant hereditary alterations, as they play a crucial role in DNA repair through homologous recombination and function as predictive biomarkers for preventive interventions and targeted therapies. The objective of this narrative review was to analyze the clinical utility of the BRCA1/BRCA2 genetic panel and its impact on breast cancer management, as well as to contextualize its value and the challenges associated with its implementation within the Mexican healthcare system. A literature review with a state-of-the-art approach was conducted, consulting high-impact databases and repositories of national and international clinical practice guidelines. Thirty articles published between 2015 and 2025 were included, prioritizing phase III clinical trials and observational studies with an emphasis on the Mexican population. The results confirmed that the BRCA1/BRCA2 panel is clinically actionable, as it enables risk stratification, intensified surveillance, surgical risk reduction, and the selection of targeted therapies such as PARP inhibitors, with demonstrated survival benefits. However, significant barriers to its implementation in Mexico were identified, including costs, infrastructure limitations, training gaps, and inequitable access. These findings underscore the need for public health policies aimed at bridging the gap between genomic knowledge and its effective clinical application.

Keywords: breast cancer; precision medicine; BRCA1/BRCA2; PARP inhibitors; clinical genetics

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Resumen

El cáncer de mama representa un desafío prioritario para la salud pública en México, al constituir la principal causa de muerte por cáncer en mujeres. Este panorama ha impulsado la transición de enfoques terapéuticos generalizados hacia la medicina de precisión, la cual adapta la prevención y el tratamiento a las características genómicas individuales. En este contexto, las mutaciones germinales en los genes BRCA1 y BRCA2 se han identificado como las alteraciones hereditarias más relevantes, al desempeñar un papel crucial en la reparación del ADN por recombinación homóloga y funcionar como biomarcadores predictivos para intervenciones preventivas y terapias dirigidas. El objetivo de esta revisión narrativa fue analizar la utilidad clínica del panel genético BRCA1/BRCA2 y su impacto en el manejo del cáncer de mama, así como contextualizar su valor y los retos de su implementación en el sistema de salud mexicano. Se realizó una revisión de la literatura con enfoque de estado del arte, consultando bases de datos de alto impacto y repositorios de guías clínicas nacionales e internacionales. Se incluyeron 30 artículos publicados entre 2015 y 2025, priorizando ensayos clínicos fase III y estudios observacionales con énfasis en la población mexicana. Los resultados confirmaron que el panel BRCA1/BRCA2 es clínicamente accionable, al permitir la estratificación de riesgo, la vigilancia intensificada, la reducción de riesgo quirúrgico y la selección de terapias dirigidas como los inhibidores de PARP, con beneficios demostrados en supervivencia. No obstante, se identificaron barreras significativas para su implementación en México, relacionadas con costos, infraestructura, capacitación y acceso equitativo. Estos hallazgos subrayan la necesidad de políticas públicas orientadas a cerrar la brecha entre el conocimiento genómico y su aplicación clínica efectiva.

Palabras clave: cáncer de mama; medicina de precisión; BRCA1/BRCA2; inhibidores de PARP; genética clínica



From gene to therapy: clinical utility of the BRCA1/BRCA2 genetic panel in precision medicine for breast cancer in Mexico

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INTRODUCTION

Breast cancer represents a major public health challenge in Mexico and remains the leading cause of cancer-related mortality among women. This scenario requires a shift from generalized treatment approaches toward precision medicine, a model that tailors therapeutic management to the genomic characteristics of each patient.

In this context, germline mutations in the BRCA1 and BRCA2 genes constitute the most clinically relevant hereditary alterations associated with breast cancer. These tumor-suppressor genes play a critical role in DNA repair through homologous recombination. Their dysfunction significantly increases cancer susceptibility and has been established as a key predictive biomarker in modern oncologic management. The clinical utility of BRCA testing is twofold: it enables targeted preventive interventions; it facilitates the use of high-efficacy targeted therapies, particularly poly(ADP-ribose) polymerase (PARP) inhibitors.

OBJETIVE

General Objective

To analyze the available evidence regarding the clinical utility of the BRCA1/BRCA2 genetic panel and its impact on breast cancer management, with the aim of contextualizing its value and identifying challenges related to its implementation within the Mexican health system.

Specific Objectives

- To describe the genetic and epidemiological foundations of hereditary risk in the Mexican population.
- To evaluate the role of BRCA testing as a preventive medicine tool and risk-stratification strategy.
- To review evidence supporting the panel as a predictive biomarker for targeted therapies, particularly PARP inhibitors.
- To identify access barriers limiting its implementation in Mexico.

METHODOLOGY

Study Design: A narrative literature review was conducted with a state-of-the-art approach.

Search Period and Sources: The literature search was performed between August and October 2025 using high-impact databases including PubMed/MEDLINE/Scielo/Google Scholar. Additionally, clinical practice guidelines from key international and national organizations were reviewed, including NCCN, ASCO, ESMO, IMSS, and INCan.

Search Strategy: A combination of English and Spanish keywords was used, including "Breast cancer", "BRCA1/BRCA2", "Precision medicine", "PARP inhibitors", "Genetic testing", "Mexico".

Selection Criteria: Thirty scientific articles and documents were analyzed. Priority was given to Evidence published in the last 10 years (2015-2025) Phase III clinical trials Observational studies focusing on the Mexican population.

RESULTS

The review confirms the existence of a distinct BRCA mutation spectrum in the Mexican population, including recurrent variants such as BRCA1 c.5374del. Evidence indicates that the BRCA1/BRCA2 panel is clinically actionable, guiding both preventive strategies and targeted therapies. Preventive strategies enabled by genetic testing:

- Intensified surveillance
- Risk-reducing surgery (risk-reducing mastectomy or salpingo-oophorectomy)



Figura 3: Barreras de Implementación de la Medicina de Precisión en México



CONCLUSIONS

The clinical utility of the BRCA1/BRCA2 genetic panel in Mexico is unequivocal and represents a paradigm shift in oncology. Genetic testing constitutes a transformative tool that enables personalized prevention strategies. Targeted therapies with improved survival outcomes. However, the primary challenge is not the lack of scientific evidence but the significant implementation gap within the Mexican healthcare system. Public health policies must prioritize equitable access to genetic testing. Investment in genomic medicine infrastructure. Training programs for healthcare professionals. Such measures are essential to translate genomic knowledge into accessible and effective clinical interventions for all patients in Mexico.

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Digital literacy in applicants to the medical degree program

Alfabetización digital en aspirantes a la carrera de Médico Cirujano

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Abstract

Digital literacy constitutes an essential competency in contemporary medical education, as it integrates skills for accessing, evaluating, creating, and ethically communicating information in digital environments. The COVID-19 pandemic exposed digital gaps that affected academic performance, particularly among medical students, highlighting the need to assess these competencies from entry into higher education in order to promote educational equity. The objective of this study was to analyze the individual factors associated with the level of digital literacy among applicants to the Bachelor of Medicine program at the Faculty of Medicine “Dr. Alberto Romo Caballero” of the Autonomous University of Tamaulipas. An observational, cross-sectional, and analytical study was conducted in an approximate sample of 360 applicants, selected through simple random sampling. The DIGI 2.0 questionnaire, consisting of 20 Likert-type items, was applied, and statistical analysis included descriptive statistics, Student’s t-tests, ANOVA, and Spearman correlations, using SPSS version 29. The results showed adequate internal consistency of the instrument ($\alpha = 0.80$) and a medium-high level of digital literacy, with a mean score of 65 points. No significant differences were identified according to sociodemographic variables; however, areas of opportunity were detected in critical information management, digital security, and content creation, supporting the need to implement digital leveling programs starting in the preparatory course.

Keywords: digital literacy; medical education; medical school applicants; digital competencies; university entry

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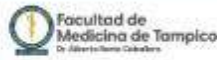
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Resumen

La alfabetización digital constituye una competencia esencial en la formación médica contemporánea, al integrar habilidades para el acceso, evaluación, creación y comunicación ética de la información en entornos digitales. La pandemia por COVID-19 evidenció brechas digitales que afectaron el desempeño académico, particularmente en estudiantes de Medicina, lo que resalta la necesidad de evaluar estas competencias desde el ingreso a la educación superior para promover la equidad educativa. El objetivo del estudio fue analizar los factores individuales asociados al nivel de alfabetización digital en aspirantes a la Licenciatura de Médico Cirujano de la Facultad de Medicina “Dr. Alberto Romo Caballero” de la Universidad Autónoma de Tamaulipas. Se realizó un estudio observacional, transversal y analítico en una muestra aproximada de 360 aspirantes, seleccionados mediante muestreo aleatorio simple. Se aplicó el cuestionario DIGI 2.0, compuesto por 20 ítems tipo Likert, y el análisis estadístico incluyó estadística descriptiva, pruebas t de Student, ANOVA y correlaciones de Spearman, utilizando SPSS versión 29. Los resultados mostraron una adecuada consistencia interna del instrumento ($\alpha = 0.80$) y un nivel medio-alto de alfabetización digital, con una media de 65 puntos. No se identificaron diferencias significativas por variables sociodemográficas; sin embargo, se detectaron áreas de oportunidad en la gestión crítica de la información, la seguridad digital y la creación de contenido, lo que respalda la necesidad de implementar programas de nivelación digital desde el curso propedéutico.

Palabras clave: alfabetización digital; educación médica; aspirantes a medicina; competencias digitales; ingreso universitario





Digital literacy in applicants to the medical degree program

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INTRODUCTION

Digital literacy has become a core competency in medical education, integrating the skills required to access, evaluate, and ethically communicate information in digital environments (Vuorikari et al., 2022; OECD, 2023). International organizations such as UNESCO (2024) and the European Digital Competence Framework (DigComp 3.0) recognize these competencies as essential for ensuring educational equity and adaptation to emerging technologies. During the COVID-19 pandemic, significant digital divides were revealed, affecting academic performance, particularly among medical students (Albahri et al., 2023; Murphy et al., 2023). In Mexico, although internet access has improved, regional disparities and differences in meaningful digital use persist (INEGI, 2025; Del-Valle-Soto et al., 2024). Assessing digital literacy among applicants to medical programs allows the identification of existing gaps and the design of leveling strategies that promote autonomous learning and educational equity from the moment students enter university (de Vries, 2024; Yuan et al., 2024).

RESULTS

A total of 360 valid questionnaires were analyzed. The DIGI 2.0 instrument demonstrated high internal consistency (Cronbach's $\alpha = 0.80$). The overall DIGI score showed a mean of 65 points (SD ≈ 10), indicating a moderate-to-high level of digital literacy among applicants. Data distribution was normal (Shapiro-Wilk test, $p > 0.05$), allowing the use of parametric statistical tests. No statistically significant differences were observed according to sex or type of high school education ($p > 0.05$; Student's t-test and ANOVA), suggesting a relatively equitable distribution of digital competencies. Spearman correlations between the DIGI score and variables such as age, academic grade average, and hours of ICT use were positive but not statistically significant ($p > 0.05$), indicating a general homogeneity in digital proficiency among applicants. However, areas requiring improvement were identified, particularly in: Critical information management, Digital security, Digital content creation. These domains exhibited greater individual variability among participants.

OBJETIVE

To analyze individual factors associated with the level of digital literacy among applicants to the Medical Doctor (MD) program.

CONCLUSIONS

A total of 360 valid questionnaires were analyzed. The DIGI 2.0 instrument demonstrated high internal consistency (Cronbach's $\alpha = 0.80$). The overall DIGI score showed a mean of 65 points (SD ≈ 10), indicating a moderate-to-high level of digital literacy among applicants. Data distribution was normal (Shapiro-Wilk test, $p > 0.05$), allowing the use of parametric statistical tests. No statistically significant differences were observed according to sex or type of high school education ($p > 0.05$; Student's t-test and ANOVA), suggesting a relatively equitable distribution of digital competencies. Spearman correlations between the DIGI score and variables such as age, academic grade average, and hours of ICT use were positive but not statistically significant ($p > 0.05$), indicating a general homogeneity in digital proficiency among applicants. However, areas requiring improvement were identified, particularly in: Critical information management, Digital security, Digital content creation. These domains exhibited greater individual variability among participants.

METHODOLY

An observational, cross-sectional, and analytical study was conducted among applicants to the Medical Doctor program at the Faculty of Medicine "Dr. Alberto Romo Caballero" of the Autonomous University of Tamaulipas. The sample was selected using simple random sampling ($n \approx 360$). Participants completed the DIGI 2.0 questionnaire, consisting of 20 Likert-type items (1-5) designed to evaluate digital competencies in the following domains: Information management, Communication, Digital content creation, Digital problem solving. Statistical analysis was performed using SPSS version 29, applying: Descriptive statistics, Student's t-test, ANOVA, Spearman correlations, Internal consistency of the instrument was assessed using Cronbach's alpha, and statistical significance was established at $p < 0.05$.

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Risk profile in the university population of the health sciences: a cross-sectional study

Perfil de riesgo en la población universitaria del área de la salud: un estudio transversal

Diana Sthefany Castillo Aran, Dra. Sarahí González Reyes, Dra. Martha Palomino Castro,
Dr. Sergio Antonio Ramírez Ríos, Dr. David Ramírez Pineda*

Abstract

Overweight and obesity constitute a global public health problem and are closely associated with an increased risk of type 2 diabetes mellitus, arterial hypertension, and dyslipidemia. In Mexico, these conditions have reached alarming levels, and university students in the health sciences are not exempt, due to factors such as prolonged academic schedules, stress, sleep deprivation, and unhealthy dietary habits. Evaluating these factors at early stages is essential for designing preventive strategies aimed at future health professionals. The objective of this study was to assess anthropometric status and metabolic risk factors among health sciences students at the beginning of the academic term, as a preliminary diagnostic phase of a longitudinal study on body weight variation. A descriptive, cross-sectional study with an epidemiological approach was conducted in a sample of 60 students from the Faculty of Medicine "Dr. Alberto Romo Caballero" of the Autonomous University of Tamaulipas, selected through stratified probabilistic sampling by semester. Data collection included digital surveys based on NOM-008-SSA3-2010, anthropometric measurements, blood pressure assessment, and laboratory analyses. The results showed that more than 50% of students presented excess body weight, with increased waist circumference and alterations in triglyceride and cholesterol levels. High levels of stress, sleep deprivation, and a significant family history of chronic diseases were also identified. These findings reveal a concerning metabolic and emotional risk profile, underscoring the need for early interventions during university training to strengthen students' overall health.

Keywords: profile of risk; university students; overweight and obesity; metabolic risk factors; university health

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Resumen

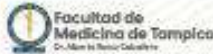
El sobrepeso y la obesidad constituyen un problema de salud pública de alcance mundial, estrechamente asociados con un mayor riesgo de diabetes mellitus tipo 2, hipertensión arterial y dislipidemias. En México, estas condiciones alcanzan cifras alarmantes y los estudiantes universitarios del área de la salud no están exentos, debido a factores como jornadas académicas extensas, estrés, privación del sueño y hábitos alimentarios inadecuados. Evaluar estos factores en etapas tempranas resulta fundamental para el diseño de estrategias preventivas dirigidas a los futuros profesionales de la salud. El objetivo del estudio fue evaluar el estado antropométrico y los factores de riesgo metabólico en estudiantes del área de la salud al inicio del periodo escolar, como fase diagnóstica preliminar de un estudio longitudinal sobre la variación del peso corporal. Se realizó un estudio descriptivo, transversal y de enfoque epidemiológico en una muestra de 60 estudiantes de la Facultad de Medicina "Dr. Alberto Romo Caballero" de la Universidad Autónoma de Tamaulipas, seleccionados mediante muestreo probabilístico estratificado por semestre. La recolección de datos incluyó encuestas digitales basadas en la NOM-008-SSA3-2010, mediciones antropométricas, presión arterial y análisis de laboratorio. Los resultados mostraron que más del 50 % de los estudiantes presentó exceso de peso, con perímetro de cintura elevado y alteraciones en triglicéridos y colesterol. Asimismo, se identificaron altos niveles de estrés, privación del sueño y una importante carga heredofamiliar de enfermedades crónicas. Estos hallazgos evidencian un perfil preocupante de riesgo metabólico y emocional, lo que subraya la necesidad de intervenciones tempranas desde la formación universitaria para fortalecer la salud integral de los estudiantes.

Palabras clave: perfil de riesgo; estudiantes universitarios; sobrepeso y obesidad; factores de riesgo metabólico; salud universitaria







Universidad Autónoma de TAMAULIPAS



Facultad de Medicina de Tampico
Dr. Alberto Romo Caballero



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Risk profile in the university population of the health sciences: a cross-sectional study

Diana Sthefany Castillo Aran, Sarahí González Reyes, Martha Palomino Castro, Sergio Antonio Ramírez Ríos, David Ramírez Pineda
Universidad Autónoma de Tamaulipas
"Dr. Alberto Romo Caballero"

INTRODUCTION


Overweight and obesity represent a major global public health problem, strongly associated with an increased risk of type 2 diabetes mellitus, hypertension, and dyslipidemia. In Mexico, the prevalence of these conditions has reached alarming levels. University students in health-related programs are not exempt from these risks. Long academic hours, psychological stress, irregular schedules, and inadequate dietary habits may contribute to excess body weight and unhealthy lifestyles. Understanding the magnitude of these factors among future healthcare professionals is essential for designing early preventive strategies. This initial phase of the study presents findings collected at the beginning of the academic cycle, establishing a baseline assessment of the nutritional, metabolic, and psychosocial status of medical students.

RESULTS

More than 50% of the students presented excess body weight (overweight or obesity), with a considerable proportion showing increased waist circumference, indicating potential cardiometabolic risk. Laboratory analyses identified elevated triglyceride and cholesterol levels in several participants. Regarding lifestyle habits, 48% frequently consumed ultra-processed foods, 56% reported eating outside the home or while performing other activities, reflecting unhealthy dietary patterns. Although 49% reported engaging in regular physical activity, its duration and intensity were insufficient to achieve optimal metabolic benefits. Two particularly relevant findings were academic stress and sleep deprivation: 53% reported sleeping six hours or less per night or experiencing poor sleep quality, 83% reported moderate to high stress levels. Additionally, 68% reported emotional symptoms, including fatigue, reduced concentration, or appetite changes, 42% reported symptoms consistent with anhedonia. A high family burden of chronic diseases was also identified, including Diabetes mellitus (81%), Hypertension (70%), Obesity (46%), Dyslipidemia or cancer (30%). Charts presented in the poster illustrate BMI distribution, waist circumference categories, and lipid profile variations among participants.

OBJETIVE

To evaluate the anthropometric status and metabolic risk factors among health sciences students at the beginning of the academic period, as a preliminary diagnostic phase of a longitudinal study on body weight variation. Specific objectives included: Measuring body weight, height, body mass index (BMI), and anthropometric variables such as neck and waist circumference at the beginning of the academic period. Applying surveys to assess dietary habits and the consumption of sugar, alcohol, and tobacco. Identifying risk factors for chronic non-communicable diseases and family history of metabolic disorders.

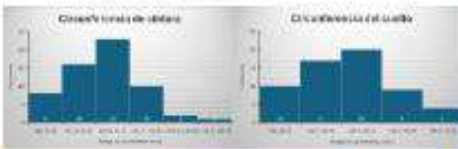


METHODOLOGY

A descriptive, cross-sectional epidemiological study was conducted as the first phase of a broader research project aimed at evaluating anthropometric profiles, lifestyle habits, and metabolic risk factors among health sciences students. The sample included 60 students aged 17-24 years from the Faculty of Medicine "Dr. Alberto Romo Caballero" of the Autonomous University of Tamaulipas, selected through stratified probabilistic sampling according to academic semester. Data collection was conducted during the Fall 2025 academic term (2025-3) and included: A digital survey (Google Forms) based on the NOM-008-SSA3-2010 standard, Anthropometric measurements: weight, height, BMI, waist circumference, and neck circumference, Blood pressure measurement using a validated manual sphygmomanometer, Laboratory analyses, including complete blood count and basic blood chemistry (six parameters). All procedures ensured anonymity, confidentiality, and digital informed consent.

CONCLUSIONS

Medical students present a concerning metabolic and emotional risk profile, characterized by excess body weight, unhealthy lifestyle habits, academic stress, and sleep disturbances. Beyond numerical indicators, these findings represent an early warning signal: future healthcare professionals are themselves exposed to risk factors that should not be normalized within medical training environments. Intervening during university education is essential to strengthen health-promoting behaviors and overall well-being among students, thereby supporting both their personal health and their future role as health promoters.



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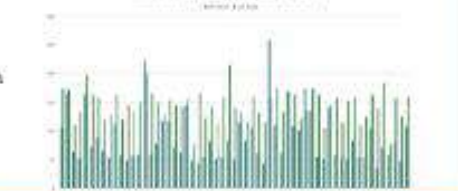


FRECUENCIA SEMANAL



ENTRENAMIENTO POR SEMANA





Artificial intelligence and its influence on 21st-century professions: a documentary analysis

La inteligencia artificial y su influencia en las profesiones del siglo XXI: un análisis documental

Juan Eduardo Alvarado Castro, Itzel Esmeralda Sánchez Reyes, Leonel Castillo Galván, Estefany Lizeth Hernández Hernández, MTI. Daniel Arturo Maupomé Rosales, Ing. Sara Isela Sifuentes Moreno*

Abstract

Artificial intelligence (AI) has become one of the most influential technological transformations of the 21st century, with a profound impact on the configuration of human work, education, and the ethical frameworks of professions. Its progressive incorporation has generated significant changes in productive processes, particularly through the automation of routine tasks, which has altered job profiles and the competencies required across multiple sectors. In this context, it is necessary to systematically analyze how AI is redefining professional practice and the emerging challenges associated with its adoption. The objective of this study was to analyze the impact of artificial intelligence on 21st-century professions, considering labor changes, emerging professional competencies, and ethical, social, and educational challenges. A documentary, non-experimental, cross-sectional study with a descriptive-analytical approach was conducted through a review of scientific literature published between 2015 and 2025 in Spanish and English. Approximately 30 relevant sources were analyzed, organizing the information into a thematic matrix and applying content analysis. The results showed that nearly 44% of current labor skills are expected to transform in the coming years due to automation. Professions based on repetitive tasks tend to decline, while those requiring critical thinking, creativity, empathy, and technological ethics are strengthening. In conclusion, AI does not replace human beings but rather redefines their role, highlighting the need for continuous training oriented toward digital literacy and the responsible use of technology.

Keywords: artificial intelligence; 21st-century professions; labor transformation; digital competencies; technological ethics

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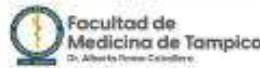
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Resumen

La inteligencia artificial (IA) se ha consolidado como una de las transformaciones tecnológicas más influyentes del siglo XXI, con un impacto profundo en la configuración del trabajo humano, la educación y los marcos éticos de las profesiones. Su incorporación progresiva ha generado cambios significativos en los procesos productivos, particularmente mediante la automatización de tareas rutinarias, lo que ha modificado los perfiles laborales y las competencias requeridas en múltiples sectores. Ante este escenario, resulta necesario analizar de manera sistemática cómo la IA está redefiniendo el ejercicio profesional y cuáles son los desafíos emergentes asociados a su adopción. El objetivo del estudio fue analizar el impacto de la inteligencia artificial en las profesiones del siglo XXI, considerando los cambios laborales, las competencias profesionales emergentes y los desafíos éticos, sociales y educativos. Se realizó una investigación documental, no experimental, transversal y con enfoque descriptivo-analítico, mediante la revisión de literatura científica publicada entre 2015 y 2025 en español e inglés. Se analizaron aproximadamente 30 fuentes relevantes, organizando la información en una matriz temática y aplicando análisis de contenido. Los resultados evidenciaron que cerca del 44 % de las habilidades laborales actuales se transformarán en los próximos años debido a la automatización. Las profesiones basadas en tareas repetitivas tienden a disminuir, mientras que se fortalecen aquellas que requieren pensamiento crítico, creatividad, empatía y ética tecnológica. En conclusión, la IA no sustituye al ser humano, sino que redefine su papel, destacando la necesidad de una formación continua orientada a la alfabetización digital y al uso responsable de la tecnología.

Palabras clave: inteligencia artificial; profesiones del siglo XXI; transformación laboral; competencias digitales; ética tecnológica





Artificial intelligence and its influence on 21st-century professions: a documentary analysis

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INTRODUCTION

This study presents a documentary, descriptive, and analytical review aimed at examining the current impact of artificial intelligence (AI) on professional fields. The research identifies the main transformations occurring in labor, education, and ethical domains. The findings indicate that AI not only automates routine tasks but also promotes new forms of collaborative work between humans and intelligent systems, generating an increasing demand for digital, cognitive, and ethical competencies. At the same time, significant challenges emerge in terms of regulation, equity, and continuous professional training, highlighting the need for adaptive strategies within educational and labor systems.

OBJETIVE

General Objective

To analyze the impact of artificial intelligence on 21st-century professions, focusing on labor transformations, emerging professional competencies, and ethical challenges.

Specific Objectives

To examine transformations generated by AI including automation, productivity changes, and evolving professional roles.

To identify emerging competencies required in AI-driven environments.

To analyze ethical, social, and educational challenges associated with AI and propose strategies for responsible adaptation.

METHODOLOGY

This research employed a documentary, non-experimental, and cross-sectional design with a descriptive-analytical approach. The study reviewed scientific literature published between 2015 and 2025 in both Spanish and English, focusing on artificial intelligence and its impact on professional sectors. Approximately 30 relevant and reliable sources were analyzed. Data were organized in a matrix according to three analytical categories:

- Labor impact
- Emerging competencies
- Ethical and regulatory implications

A content analysis approach was applied to identify patterns, trends, and differences across the literature. Summary tables were used to facilitate interpretation.

RESULTS

The study revealed that artificial intelligence is reshaping the structure of employment across nearly all sectors. According to the reviewed analyses, approximately 44% of current workplace skills are expected to transform in the coming years due to automation. The professions most affected are those characterized by repetitive and routine tasks, while professions related to creativity, data analysis, and technological ethics are becoming increasingly valuable. The findings also highlight:

- Growing demand for digital competencies
- Greater emphasis on critical thinking
- The need for continuous professional training to adapt to technological change

Overall, the results indicate that AI does not replace human beings but rather redefines their role, fostering collaboration between individuals and intelligent systems.

Instead of eliminating professions entirely, AI enables human-machine collaboration, allowing greater precision and productivity.

Occupations requiring empathy, creativity, and critical reasoning are strengthened, as they combine uniquely human capabilities with intelligent technological tools.

CONCLUSIONS

Artificial intelligence is transforming the labor market and redefining the meaning of human work. Rather than replacing jobs entirely, AI highlights the importance of distinctively human competencies, such as empathy, creativity, and ethical judgment. Routine tasks are increasingly automated, while professions requiring critical thinking, social sensitivity, and interdisciplinary problem-solving gain relevance. Education plays a fundamental role in this transition by preparing individuals capable of understanding and responsibly using emerging technologies. In this context, digital literacy and ethical awareness have become indispensable competencies. The impact of AI ultimately depends on how it is implemented: it can drive technological and social progress or exacerbate existing inequalities. The true challenge is not competing with machines but learning to coexist with them while preserving human values and social responsibility.

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Influence of personal and contextual factors on academic satisfaction in medical students

Influencia de factores personales y contextuales en la satisfacción académica de estudiantes de medicina

Ángel Manuel Antonio Santiago, Oscar Eduardo Flores Sánchez, Cassandra Meza Gómez,
Dra. Alma Alicia Peña Maldonado*

Resumen

Medical training requires high levels of commitment, autonomy, and resilience; therefore, academic satisfaction has become a key indicator of educational quality and student well-being. Such satisfaction is influenced by personal factors, such as motivation and learning style, as well as by contextual conditions, including academic workload, socioeconomic environment, and faculty support. In the Medical Degree program at the Faculty of Medicine of Tampico “Dr. Alberto Romo Caballero,” curricular intensity and evaluative pressure make academic satisfaction particularly vulnerable, which justifies its systematic analysis. The objective of this study was to analyze how learning style, motivation to study Medicine, socioeconomic factors, perceived academic workload, and faculty support influence academic satisfaction among medical students at the Autonomous University of Tamaulipas. A quantitative, cross-sectional, and correlational study was conducted using a survey design in a sample of 251 active students. Overall academic satisfaction was assessed using a 7-point Likert scale, while the independent variables showed adequate reliability indices ($\alpha = 0.74-0.86$). The analysis included descriptive statistics, Pearson correlation, and multiple linear regression. The results indicated that the explanatory model accounted for 68% of the variability in academic satisfaction. Intrinsic motivation was the main predictor, followed by a self-regulated learning style and perceived faculty support, while the academic semester showed no significant effect. These findings support the implementation of educational interventions focused on strengthening motivation, faculty mentoring, and students’ academic autonomy.

Keywords: academic satisfaction; medical students; personal factors; contextual factors; medical education

Abstract

La formación médica exige altos niveles de compromiso, autonomía y resiliencia, por lo que la satisfacción académica se ha consolidado como un indicador clave de calidad educativa y bienestar estudiantil. Dicha satisfacción se encuentra influida por factores personales, como la motivación y el estilo de aprendizaje, así como por condiciones contextuales, entre ellas la carga académica, el entorno socioeconómico y el apoyo docente. En la carrera de Médico Cirujano de la Facultad de Medicina de Tampico “Dr. Alberto Romo Caballero”, la intensidad curricular y la presión evaluativa hacen que la satisfacción académica sea particularmente vulnerable, lo que justifica su análisis sistemático. El objetivo del estudio fue analizar cómo el estilo de aprendizaje, la motivación para estudiar Medicina, los factores socioeconómicos, la percepción de carga académica y el apoyo docente influyen en la satisfacción académica de los estudiantes de Medicina de la Universidad Autónoma de Tamaulipas. Se desarrolló un estudio cuantitativo, transversal y correlacional mediante un diseño de encuesta, en una muestra de 251 estudiantes activos. La satisfacción académica general se evaluó mediante una escala Likert de 7 puntos, mientras que las variables independientes mostraron adecuados índices de confiabilidad ($\alpha = 0.74-0.86$). El análisis incluyó estadística descriptiva, correlación de Pearson y regresión lineal múltiple. Los resultados indicaron que el modelo explicativo alcanzó un 68 % de la variabilidad en la satisfacción académica. La motivación intrínseca fue el principal predictor, seguida del estilo de aprendizaje autorregulado y el apoyo docente percibido, mientras que el semestre cursado no mostró efecto significativo. Estos hallazgos respaldan la implementación de intervenciones educativas centradas en fortalecer la motivación, el acompañamiento docente y la autonomía académica del estudiante.

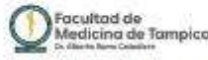
Palabras clave: satisfacción académica; estudiantes de medicina; factores personales; factores contextuales; educación médica

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Influence of personal and contextual factors on academic satisfaction in medical students

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INTRODUCTION

Medical education requires high levels of commitment, autonomy, and resilience. Academic satisfaction has become a key indicator of educational quality and is influenced by personal factors, such as learning style and motivation, as well as contextual conditions, including socioeconomic environment, academic workload, and faculty support. Within the Medical Surgeon program at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero," the demanding curriculum, evaluative pressure, and stress inherent to the medical profession make academic satisfaction particularly vulnerable. This study is framed within the field of educational research in medical training, with a specific focus on student well-being in high-demand academic contexts.

OBJETIVE

The objective of this study is to analyze how learning style, motivation to study medicine, socioeconomic factors, perceived academic workload, and faculty support influence the academic satisfaction of medical students at the Universidad Autónoma de Tamaulipas. The study aims to identify key predictors associated with academic satisfaction in order to generate evidence that can inform the design of more effective educational strategies focused on improving student well-being and academic experience during medical training.

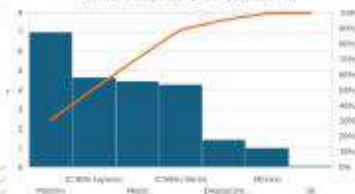
METHODOLOGY

This study was conducted using a quantitative approach with a cross-sectional and correlational survey design. The target population consisted of active students enrolled in the Medical Surgeon program at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero," located in Tampico, Tamaulipas. A total of 251 participants were included in the sample. The dependent variable of the study was General Academic Satisfaction, which was measured using a seven-point Likert scale. Independent variables included preferred learning style, motivation to study medicine, perceived faculty support, and perceived academic workload. These variables were measured through Likert-type items ranging from one to seven and demonstrated adequate internal consistency, with Cronbach's alpha coefficients ranging from 0.74 to 0.86. Data analysis included descriptive statistical procedures to summarize the characteristics of the variables. Pearson correlation analysis was used to evaluate bivariate associations between predictors and academic satisfaction. In addition, multiple linear regression analysis was conducted to determine the partial contribution and predictive power of each independent variable with respect to the dependent variable. All analyses were performed using a confidence level of 95%, ensuring that the statistical assumptions required for regression analysis were adequately verified.

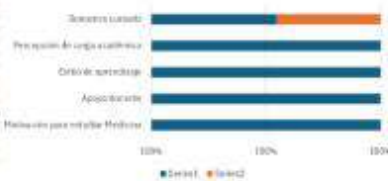
RESULTS

The analysis of the cross-sectional cohort, which included 251 participants, revealed that the multiple linear regression model explained approximately 68% of the variance in academic satisfaction. Among the variables analyzed, motivation to study medicine emerged as the most influential predictor, presenting the highest predictive weight with a regression coefficient of $B = 0.34$. This finding indicates that students with stronger intrinsic motivation toward studying medicine tend to report higher levels of academic satisfaction, regardless of the influence of other variables included in the model. Self-regulated learning strategies associated with preferred learning styles were identified as the second most important predictor, with a regression coefficient of $B = 0.28$. This result highlights the relevance of autonomous learning practices, planning abilities, and self-management of academic tasks in shaping students' satisfaction with their academic experience. Perceived faculty support was identified as the third most significant predictor, with a regression coefficient of $B = 0.26$. The results suggest that the accessibility of instructors, the quality of academic guidance, and the perceived level of mentorship play a substantial role in influencing students' academic satisfaction. Finally, perceived academic workload demonstrated a positive but comparatively smaller effect on academic satisfaction, with a regression coefficient of $B = 0.21$. Although the influence of this variable was lower than that of the other predictors, it still contributed to explaining variations in students' perceptions of their academic experience.

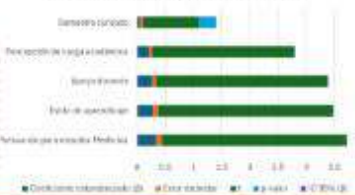
Estadísticos descriptivos por variable



Matriz de correlaciones de Pearson (satisfacción académica vs predictores)



Modelo predictivo: regresión lineal múltiple



CONCLUSIONS

The findings of this study indicate that academic satisfaction among medical students at the Universidad Autónoma de Tamaulipas is primarily associated with modifiable factors, particularly intrinsic motivation, self-regulated learning strategies, and perceived faculty support. Together, these variables explain a substantial proportion of the variability observed in academic satisfaction among students. In contrast, the academic semester in which students were enrolled did not demonstrate a statistically significant effect on academic satisfaction, suggesting that the quality of the educational experience may depend more on motivational and pedagogical factors than on the stage of training itself. These results support the implementation of educational interventions aimed at strengthening intrinsic motivation, improving faculty mentoring and academic support systems, and promoting autonomous learning strategies among students. Such measures could contribute to enhancing both academic satisfaction and overall student well-being within demanding medical training environments.

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Mechanisms related to the development of benign paroxysmal positional vertigo in patients with cervical injury: a literature review

Mecanismos relacionados con el desarrollo del vértigo postural paroxístico benigno en pacientes con lesión cervical: revisión de la literatura

Rodolfo Yahel Mar Delgado, Dr. Francisco Vázquez Nava*

Abstract

Benign paroxysmal positional vertigo (BPPV) is one of the most common causes of vertigo worldwide and is mainly associated with changes in head position. Various traumatic mechanisms have been implicated in its development, particularly those that result in cervical injury. Identifying these mechanisms is essential to prevent complications, optimize diagnostic approaches, and improve therapeutic outcomes, especially in patients with a history of cervical trauma. The objective of this literature review was to analyze the mechanisms related to the development of BPPV in patients with cervical injury, based on the available scientific evidence. A bibliographic search was conducted in databases such as PubMed and Google Scholar, using keywords, Boolean operators, and connectors, following a systematic methodological approach. Initially, approximately 700 articles were identified; after a selection process based on inclusion and exclusion criteria, five relevant studies were analyzed. The results showed that the main traumatic mechanisms associated with the development of BPPV in patients with cervical injury include falls, traffic accidents, and whiplash injury. In addition, a frequent coexistence of vestibular hypofunction was identified, particularly in older adults and in patients with traumatic brain injury. The evidence suggests a significant association between cervical injury and the development of BPPV, highlighting the importance of comprehensive clinical evaluation and individualized management in this group of patients.

Keywords: benign paroxysmal positional vertigo; cervical injury; traumatic mechanisms; vestibular system; positional dizziness

Resumen

El vértigo postural paroxístico benigno (VPPB) es una de las causas más frecuentes de vértigo a nivel mundial y se asocia principalmente con cambios de posición cefálica. Diversos mecanismos traumáticos han sido implicados en su desarrollo, particularmente aquellos que generan lesión cervical. La identificación de dichos mecanismos resulta fundamental para prevenir complicaciones, optimizar el abordaje diagnóstico y mejorar los resultados terapéuticos, especialmente en pacientes con antecedente de traumatismo cervical. El objetivo de esta revisión de la literatura fue analizar los mecanismos relacionados con el desarrollo del VPPB en pacientes con lesión cervical, a partir de la evidencia científica disponible. Se realizó una búsqueda bibliográfica en bases de datos como PubMed y Google Scholar, utilizando palabras clave, operadores booleanos y conectores, conforme a un enfoque metodológico sistemático. Inicialmente se identificaron aproximadamente 700 artículos, de los cuales, tras un proceso de selección por criterios de inclusión y exclusión, se analizaron cinco estudios relevantes. Los resultados mostraron que los principales mecanismos traumáticos asociados al desarrollo de VPPB en pacientes con lesión cervical incluyen caídas, accidentes de tránsito y latigazo cervical. Asimismo, se identificó una frecuente coexistencia de hipofunción vestibular, especialmente en adultos mayores y en pacientes con traumatismo craneoencefálico. La evidencia sugiere una conexión significativa entre la lesión cervical y el desarrollo del VPPB, lo que resalta la importancia de una evaluación clínica integral y un manejo individualizado en este grupo de pacientes.

Palabras clave: vértigo postural paroxístico benigno; lesión cervical; mecanismos traumáticos; sistema vestibular; mareo posicional

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Mechanisms related to the development of benign paroxysmal positional vertigo in patients with cervical injury: a literature review

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Facultad de Medicina de Tampico "Dr. Alberto Romo Caballero"

INTRODUCTION

Benign Paroxysmal Positional Vertigo (BPPV) is a frequent pathology worldwide, generated by different traumatic mechanisms that need to be analyzed. According to recent research, in the pediatric population it turns out to be a condition that is not very frequent with a prevalence of 0.4% to 8%, while in adulthood it is 17-42%. One of the fundamental strategies to limit the development of the symptomatology and complications of vertigo is to determine the mechanisms that favor its development.

OBJETIVE

To analyze the mechanisms related to the development of Benign Paroxysmal Positional Vertigo (BPPV) in patients with cervical injury, based on the available literature.

METHODOLOGY

A search was carried out in the different databases: PubMed, Google Scholar, etc., for the updated detection obtained through the development of research based on the scientific method. Keywords, Boolean operators and connectors were used for their identification.

RESULTS

Initially, 700 articles were identified, of which, after a process, five studies that met the criteria established for their inclusion in the analysis were selected.

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AUTORES	TITULO	CONCLUSIONES
Caro Herrera J. H., et al.	Evaluación del vértigo y trastornos del equilibrio en pacientes con tamboaje vascular y positivo.	El episodio de vértigo es asociado principalmente a cambios de posición a nivel cervical se debe indagar acerca del compromiso de los movimientos del cuello en el plano horizontal.
Alfonso Avila Y. S., et al.	Evaluación del vértigo y/o trastornos del equilibrio en pacientes con tamboaje cervical positivo.	El grupo de BPPV+ mostró mayores déficits de orientación sensorial. Se debe estar atentos a la hipofunción vestibular coexistente en los adultos mayores con VPPB, ya que esto puede acompañar su ya deteriorado control postural más que el VPPB solo.
Pazwels S, et al.	La hipofunción vestibular coexistente afecta el control postural pero no la fragilidad y el bienestar, en adultos mayores con vértigo posicional paroxístico.	No se encontró asociación entre el VPPB y la postura cervical. La disminución de la lordosis cervical es consecuencia del VPPB, no su causa etiológica. El VPPB puede estar acompañado de patologías cervicales dolorosas.
Ortobogo Cetik T, et al.	Análisis de la postura cervical en pacientes con vértigo posicional paroxístico benigno.	En el paciente con lesión medular cervical aguda y presencia de VPPB, el diagnóstico y tratamiento adecuado, individualizado y minimizando los riesgos puede ofrecer una resolución completa del vértigo.
Peñalosa Polo P, et al.	Patient with cervical spinal cord injury and benign paroxysmal positional vertigo treated with particle repositioning maneuvers.	La presencia de paresia vestibular en pacientes con VPPB secundario a TCE, no es un hallazgo infrecuente, en el estudio, correspondió a un 35,4%, siendo este más frecuente en hombres.

CONCLUSIONS

The traumatic mechanisms identified that favor cervical injury and consequently the development of BPPV are falls, traffic accidents and whiplash; therefore, there is an important connection between cervical injury and the development of BPPV.

Adaptation of renal function in individuals with chronic kidney disease: a literature review

Adaptación de la función renal en personas con enfermedad renal crónica: revisión de literatura

Erika Edith Orta Salazar, Dr. Francisco Vázquez Nava*

Abstract

Chronic kidney disease is characterized by a progressive and irreversible loss of renal function that triggers various adaptive mechanisms aimed at maintaining homeostasis and the glomerular filtration rate. Among these mechanisms, glomerular hyperfiltration, hypertrophy of the remaining nephrons, and activation of neurohormonal systems—particularly the renin-angiotensin-aldosterone system—are prominent. Although these compensatory responses allow temporary preservation of renal function, evidence shows that they contribute significantly to progressive structural damage, promoting glomerulosclerosis, chronic inflammation, and interstitial fibrosis. The objective of this review was to analyze the main mechanisms of renal function adaptation in individuals with chronic kidney disease and their role in disease progression. A narrative review of the scientific literature was conducted through a systematic search of articles in biomedical databases, selecting studies that addressed the physiological, hemodynamic, and structural changes associated with renal adaptation. The findings indicate that sustained hyperfiltration and the activation of inflammatory and fibrogenic mediators accelerate functional renal deterioration. Overall, these results underscore that adaptive mechanisms, while initially protective, represent a key factor in the progression of chronic kidney disease, highlighting the importance of their early identification and the development of therapeutic strategies aimed at limiting their deleterious effects and delaying disease progression.

Keywords: chronic kidney disease; renal adaptation; glomerular hyperfiltration; compensatory mechanisms; renal progression

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Resumen

La enfermedad renal crónica se caracteriza por una pérdida progresiva e irreversible de la función renal que desencadena diversos mecanismos de adaptación con el objetivo de mantener la homeostasis y la tasa de filtración glomerular. Entre estos mecanismos destacan la hiperfiltración glomerular, la hipertrofia de las nefronas remanentes y la activación de sistemas neurohormonales, particularmente el sistema renina-angiotensina-aldosterona. Aunque estas respuestas compensatorias permiten preservar de manera temporal la función renal, la evidencia demuestra que contribuyen de forma significativa al daño estructural progresivo, favoreciendo la esclerosis glomerular, la inflamación crónica y la fibrosis intersticial. El objetivo de esta revisión fue analizar los principales mecanismos de adaptación de la función renal en personas con enfermedad renal crónica y su papel en la progresión de la enfermedad. Se realizó una revisión narrativa de la literatura científica mediante la búsqueda sistematizada de artículos en bases de datos biomédicas, seleccionando estudios que abordaron los cambios fisiológicos, hemodinámicos y estructurales asociados a la adaptación renal. Los hallazgos indican que la hiperfiltración sostenida y la activación de mediadores inflamatorios y fibrogénicos aceleran el deterioro funcional renal. En conjunto, estos resultados subrayan que los mecanismos adaptativos, si bien inicialmente protectores, representan un factor clave en la progresión de la enfermedad renal crónica, lo que resalta la importancia de su identificación temprana y del diseño de estrategias terapéuticas dirigidas a limitar sus efectos deletéreos y retrasar la evolución de la enfermedad.

Palabras clave: enfermedad renal crónica; adaptación renal; hiperfiltración glomerular; mecanismos compensatorios; progresión renal



Adaptation of renal function in individuals with chronic kidney disease: a literature review

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INTRODUCTION

Chronic Kidney Disease (CKD) is one of the most prevalent pathologies at the population level. It involves a progressive loss of renal function, and its adaptation is the result of the physical and chemical processes that participate in the activities of the organism.

OBJETIVE

Analyze the elements involved in renal adaptation: enzymes, proteins, and hormones; the stability of renal function and the adaptability of other systems in response to renal needs

METHODOLOGY

A search was conducted in various databases to identify up-to-date information obtained through the development of research based on the scientific method.

PubMed, Google Scholar, Elsevier.

Boolean search operators such as: Chronic Kidney Disease AND functional compensatory.

RESULTS

Yamahara et al.	the functions of the nutrient-sensing complex (mTORC1), autophagy, and ketone bodies... during fasting... ketone bodies inhibit mTORC1, showing renoprotective potential
Fattah et al.	The greater the tubular load, the greater the recruitment of the membrane and the expression of tubular transport proteins, inducing hypertrophy and improving transport capacity, but increasing oxygen consumption and wear
Lu et al.	The overexpression of active GSK3 β suppresses the function of Nrf2 in response to stress, whereas the dominant-negative form restored the antioxidant response.

CONCLUSIONS

The mechanisms of adaptation show how the kidney adapts to the progressive loss of more than 80.0% of its functional mass, from hyperfiltration with prior hypertrophy, nephron loss, and even renoprotective mechanisms mediated by ketone bodies

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Influence of academic advising on the development of study skills in medical students at the Faculty of Medicine of Tampico “Dr. Alberto Romo Caballero”

Influencia de la asesoría académica en el desarrollo de habilidades de estudio en estudiantes de medicina de la Facultad de Medicina de Tampico “Dr. Alberto Romo Caballero”

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Abstract

Academic advising constitutes a pedagogical strategy aimed at supporting students throughout their educational process, particularly in highly demanding programs such as medical training, where the development of effective study skills is essential for adequate academic performance. In contexts characterized by curricular overload and sociodemographic diversity, such as the Faculty of Medicine “Dr. Alberto Romo Caballero,” questions remain regarding the effectiveness and actual utilization of these institutional programs. The objective of this study was to evaluate the influence of academic advising on the development of study skills among second- and third-year medical students, as well as to analyze their perceptions of the program’s usefulness and awareness. A quantitative, cross-sectional, and correlational study was conducted in a random sample of 230 students, of whom 80% were surveyed. The validated instrument “Academic Advising as Educational Support” was administered through a digital form, and statistical analysis was performed using SPSS. The results showed that although most students were aware of the program’s existence, its frequency of use was low; however, 87.6% of those who attended advising sessions reported improvements in academic performance and study skills. In conclusion, academic advising is identified as a useful tool in medical education, highlighting the need for greater institutional dissemination and promotion to enhance its positive impact on students’ academic development.

Keywords: academic advising; study skills; medical students; academic performance; educational support

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Resumen

La asesoría académica constituye una estrategia pedagógica orientada a acompañar al estudiante en su proceso formativo, particularmente en programas de alta exigencia como la carrera de Medicina, donde el desarrollo de habilidades de estudio resulta fundamental para un desempeño académico adecuado. En contextos caracterizados por sobrecarga curricular y diversidad sociodemográfica, como la Facultad de Medicina “Dr. Alberto Romo Caballero”, persisten interrogantes sobre la efectividad y el aprovechamiento real de estos programas institucionales. El objetivo del estudio fue evaluar la influencia de la asesoría académica en el desarrollo de habilidades de estudio en estudiantes de segundo y tercer año de la Licenciatura de Médico Cirujano, así como analizar su percepción sobre la utilidad y el conocimiento del programa. Se realizó un estudio cuantitativo, transversal y correlacional en una muestra aleatoria de 230 estudiantes, de los cuales se encuestó al 80 %. Se utilizó el instrumento validado “Asesoría Académica como apoyo escolar”, aplicado mediante formulario digital, y el análisis estadístico se efectuó con SPSS. Los resultados mostraron que, aunque la mayoría de los estudiantes conoce la existencia del programa, la frecuencia de uso es baja; sin embargo, el 87.6 % de quienes asistieron a sesiones reportó mejoras en el rendimiento académico y en sus habilidades de estudio. En conclusión, la asesoría académica se identifica como una herramienta útil en la formación médica, siendo necesaria una mayor difusión y promoción institucional para ampliar su impacto positivo en el desarrollo académico de los estudiantes.

Palabras clave: asesoría académica; habilidades de estudio; estudiantes de medicina; rendimiento académico; apoyo educativo





Influence of academic advising on the development of study skills in medical students at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero"

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INTRODUCTION

Academic advising is a pedagogical strategy aimed at guiding students throughout their educational process. Medical training requires not only the acquisition of technical and scientific knowledge, but also the sustained development of study skills that enable students to successfully face highly demanding academic and clinical environments. In institutions such as the Faculty of Medicine "Dr. Alberto Romo Caballero," where the student profile reflects regional dynamics marked by sociodemographic diversity and curricular overload, it becomes essential to understand the factors that influence the consolidation of competencies for autonomous learning. Academic advising, as an institutional resource, has been recognized in multiple studies as a mechanism that can improve organization, self-regulation, and knowledge retention; however, questions remain regarding its effectiveness in specific contexts and how it is perceived by the student population to whom it is directed.

OBJETIVE

General objective:
To evaluate the influence of academic advising on the development of study skills among students of the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero"

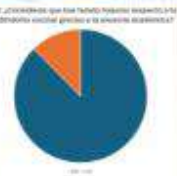
- Specific objectives:**
- To analyze students' perception of the usefulness of academic advising.
 - To identify the level of knowledge students have about the academic advising program offered by their faculty.

METHODOLOGY

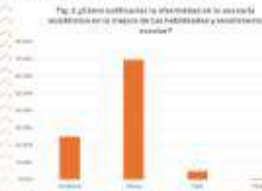
A correlational design was carried out to establish relationships between academic advising and the development of study skills in university contexts. The study population consisted of second- and third-year students of the Medical Surgeon program at the Faculty of Medicine of Tampico "Dr. Alberto Romo Caballero." A quantitative, cross-sectional, and correlational design was used, employing the validated instrument "Academic Advising as School Support Survey," developed by the Ethics Workshop (Technological Institute of Tijuana), applied through a Forms questionnaire, consisting of a total of 15 items that evaluated students' perceptions of the academic advising program offered by their faculty. The sample size was 230 students, randomly selected. Statistical analysis was performed using SPSS.

RESULTS

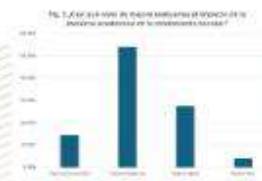
According to the established sample of 230 students, 80% were successfully surveyed, equivalent to 184 second- and third-year students of the Medical Surgeon program at the Faculty of Medicine "Alberto Romo Caballero." After the analysis of the data, the following results were obtained: 87.6% of the surveyed students indicated improvements in academic performance with the guidance of academic advising. The remaining students disagreed, as shown in Figure 1.



Students rate academic advising and its influence on the improvement of study skills and academic performance satisfactorily, obtaining mostly positive responses, as shown in Figure 2.



In relation to the proposed objective—the students' perception of academic usefulness—34.1% of the surveyed students indicated a moderate improvement regarding the impact of academic advising on their academic performance, while 14.5% reported an exceptional improvement. The remaining students have not experienced satisfactory academic advising, as shown in Figure 3.



Finally, satisfactory results were obtained in identifying students' knowledge about the academic advising program: 98.4% of the surveyed students are informed about the availability of this program at the Faculty of Medicine "Alberto Romo Caballero."

CONCLUSIONS

Second- and third-year students of the Medical Surgeon program are aware of the academic advising program offered by the faculty; however, the percentage of students who frequently attend academic advising sessions during the semester is very low. Of the students who attend academic advising sessions, the majority report satisfactory results, positively impacting the development of study skills and academic performance. In conclusion, academic advising is a useful tool in the training of medical students, and effective dissemination of the academic advising program is beneficial so that more students have the opportunity to improve their academic and social outcomes.

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Unlocking inner calm: the co-intervention of psychobiotics and exercise as a strategy against depression, anxiety and neuroinflammation

Desbloqueando do la calma interior: la co-intervención de psicobióticos y ejercicio como estrategia contra depresión, ansiedad y neuroinflamación

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Abstract

Mood disorders, such as depression and anxiety, represent a significant global burden and are associated with high rates of nonresponse to conventional pharmacological treatments. In this context, the gut–microbiota–brain axis has emerged as a new pathophysiological paradigm, in which intestinal dysbiosis, reduced short-chain fatty acid production, and increased intestinal permeability promote the translocation of proinflammatory mediators, triggering neuroinflammation and oxidative stress. The objective of this systematic review was to analyze the scientific evidence on the co-intervention of psychobiotics and physical exercise as an integrative therapeutic strategy for depression and anxiety. A systematic review was conducted in accordance with the PRISMA 2020 statement, through a search of literature published between 2019 and 2025 in databases such as PubMed, Elsevier, JAMA Network, BMJ Group, SciELO, and BMC Psychiatry. Meta-analyses and experimental studies evaluating the therapeutic synergy of specific probiotics and physical exercise were included, and a narrative synthesis and methodological quality assessment were performed. The results demonstrated that specific psychobiotic strains, such as *Lactobacillus gasseri* and *Bifidobacterium longum*, in combination with physical exercise, significantly reduce depressive and anxiety symptoms by modulating systemic inflammation, promoting the release of neurotrophic factors, and enhancing neuronal resilience. Overall, the evidence supports the gut–microbiota–brain axis as a central regulator of mood disorders and endorses this co-intervention as a promising and integrative therapeutic strategy.

Keywords: psychobiotics; physical exercise; depression; anxiety; gut–microbiota–brain axis

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Resumen

Los trastornos del estado de ánimo, como la depresión y la ansiedad, representan una carga global significativa y se asocian con altas tasas de no respuesta a los tratamientos farmacológicos convencionales. En este contexto, el eje microbiota-intestino-cerebro ha emergido como un nuevo paradigma fisiopatológico, en el que la disbiosis intestinal, la reducción de ácidos grasos de cadena corta y el aumento de la permeabilidad intestinal favorecen la translocación de mediadores proinflamatorios, desencadenando neuroinflamación y estrés oxidativo. El objetivo de esta revisión sistemática fue analizar la evidencia científica sobre la co-intervención de psicobióticos y ejercicio físico como estrategia terapéutica integral para la depresión y la ansiedad. Se realizó una revisión sistemática conforme a la declaración PRISMA 2020, mediante la búsqueda de literatura publicada entre 2019 y 2025 en bases de datos como PubMed, Elsevier, JAMA Network, BMJ Group, SciELO y BMC Psychiatry. Se incluyeron metaanálisis y estudios experimentales que evaluaron la sinergia terapéutica de probióticos específicos y ejercicio físico, realizándose una síntesis narrativa y una valoración de la calidad metodológica. Los resultados demostraron que cepas psicobióticas específicas, como *Lactobacillus gasseri* y *Bifidobacterium longum*, en combinación con ejercicio físico, reducen de manera significativa los síntomas depresivos y ansiosos, al modular la inflamación sistémica, favorecer la liberación de factores neurotróficos y mejorar la resiliencia neuronal. En conjunto, la evidencia valida al eje microbiota-intestino-cerebro como un regulador central de los trastornos del ánimo y respalda esta co-intervención como una estrategia terapéutica prometedora e integradora.

Palabras clave: psicobióticos; ejercicio físico; depresión; ansiedad; eje microbiota-intestino-cerebro

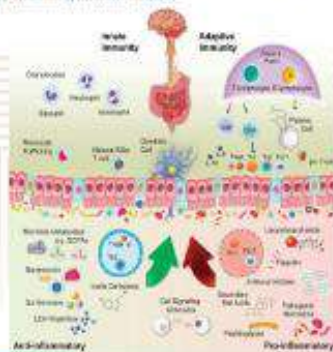


"Unlocking inner calm: the co-intervention of psychobiotics and exercise as a strategy against depression, anxiety and neuroinflammation"

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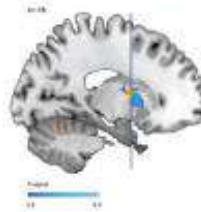
INTRODUCTION

Some neuropsychiatric disorders such as depression and anxiety represent a significant global burden, with high rates of non-response to conventional therapies. The new microbiota-gut-brain axis paradigm proposes that intestinal dysbiosis is a key etiological factor. Dysbiosis reduces short-chain fatty acids (SCFAs), causing intestinal permeability, also known as "leaky gut," generating a pathogenic vicious cycle. This promotes the translocation of pro-inflammatory products, triggering neuroinflammation and oxidative stress, which underlie depression and anxiety. In response to these pathogenic processes, physical exercise and psychobiotics act as powerful modulators. Exercise improves the intestinal environment by increasing blood flow and motility, creating a favorable environment for probiotic bacteria, while probiotics repair the intestinal barrier. We propose that their dual synergistic action offers a more efficient treatment strategy.



RESULTS

The systematic review validates the microbiota-gut-brain axis as a central regulatory axis in the modern pathophysiology of mood disorders (depression and anxiety). The therapeutic key evaluated is the restoration of the homeostasis of this axis, reversing neuroinflammation. The collected evidence demonstrates the effectiveness of psychobiotics (specific strains (e.g. Lactobacillus gasseri, B. longum), which achieve a significant reduction in characteristic symptoms. Synergy was confirmed with the application of physical exercise in combination with probiotics, enhancing the release of neurotrophic factors and neuronal resilience. The relevance of these findings highlights their important implications for the adult population with mood disorders, and suggests that they could become a promising strategy to improve cognition in populations that have not yet been studied, such as autism and ADHD.



OBJETIVE

It is intended to establish a comprehensive therapeutic strategy by presenting the biological causality of the co-intervention of probiotics from specific bacterial strains and the implementation of exercise to help promote intestinal well-being, in order to achieve a reduction in the clinical manifestations of the most common mental disorders.

METHODOLOGY

Type of study: Systematic review based on the official PRISMA 2020 statement.
Databases: PubMed, Frontiers, Elsevier, JAMA Network, SciELO, EMI Group, Hospital Psiquiátrico de La Habana, MedCrave, BMC Psychiatry.
Period: 2010-2025.
Criteria: Articles with meta-analyses and experimental evaluation that demonstrate the synergy of therapeutic applications of interest, based on specific literature from national academic centers.
Analysis: Narrative synthesis of results and assessment of methodological quality.

CONCLUSIONS

In conclusion, the evidence is categorical the combination of probiotics and physical exercise represents an integrative and effective treatment model for mood disorders. This therapeutic effect is achieved through the reduction of systemic inflammation and the modulation of neuronal activity, which validates the intervention of the microbiota-gut-brain axis as a central anti-inflammatory pathological mechanism. The fundamental importance of this work lies in its contribution to the understanding of the biological causality of co-intervention in comprehensive mental health, by laying the foundations for the optimization of therapeutic strategies and the search for a reduction in symptoms, redirecting the clinical approach to the aforementioned disorders.

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Datopotamab deruxtecan: hope against metastatic triple-negative breast cancer

Datopotamab deruxtecan la esperanza frente al cáncer de mama metastásico triple negativo

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Abstract

Breast cancer is the most common malignant neoplasm among women and one of the leading causes of cancer-related mortality worldwide. Among its molecular subtypes, triple-negative breast cancer is characterized by the absence of hormone receptors and HER2 expression, which limits therapeutic options and is associated with an unfavorable prognosis. In this context, advances in targeted therapies have enabled the development of new drugs with specific molecular targets. The objective of this work was to present datopotamab deruxtecan as an emerging and promising therapeutic option for the treatment of metastatic triple-negative breast cancer, highlighting its mechanism of action and recent clinical outcomes. A review of the scientific literature and regulatory reports was conducted, including clinical trials and official communications, with emphasis on studies published between 2023 and 2025. The results showed that datopotamab deruxtecan, an antibody–drug conjugate targeting TROP-2, demonstrated superiority over conventional chemotherapy in terms of progression-free survival and tolerability, particularly in patients with previously treated advanced disease. In conclusion, datopotamab deruxtecan represents a relevant therapeutic advance in a clinical setting with limited options, offering a targeted strategy with the potential to improve disease control and quality of life in patients with triple-negative breast cancer.

Keywords: educational gamification; medical education; perceived effectiveness; meaningful learning; gamified challenges

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Resumen

El cáncer de mama constituye la neoplasia maligna más frecuente en mujeres y una de las principales causas de mortalidad oncológica a nivel mundial. Dentro de sus subtipos moleculares, el cáncer de mama triple negativo se caracteriza por la ausencia de receptores hormonales y HER2, lo que limita las opciones terapéuticas y se asocia con un pronóstico desfavorable. En este contexto, los avances en terapias dirigidas han permitido el desarrollo de nuevos fármacos con blancos moleculares específicos. El objetivo de este trabajo fue presentar a datopotamab deruxtecan como una opción terapéutica emergente y prometedora para el tratamiento del cáncer de mama metastásico triple negativo, destacando su mecanismo de acción y resultados clínicos recientes. Se realizó una revisión de la literatura científica y de reportes regulatorios, incluyendo ensayos clínicos y comunicados oficiales, con énfasis en estudios publicados entre 2023 y 2025. Los resultados mostraron que datopotamab deruxtecan, un conjugado anticuerpo-fármaco dirigido contra TROP-2, demostró superioridad frente a la quimioterapia convencional en términos de supervivencia libre de progresión y tolerabilidad, particularmente en pacientes con enfermedad avanzada previamente tratada. En conclusión, datopotamab deruxtecan representa un avance terapéutico relevante en un escenario clínico con opciones limitadas, ofreciendo una estrategia dirigida con potencial para mejorar el control de la enfermedad y la calidad de vida de las pacientes con cáncer de mama triple negativo.

Palabras clave: datopotamab deruxtecan; cáncer de mama triple negativo; TROP-2; terapia dirigida; conjugado anticuerpo-fármaco

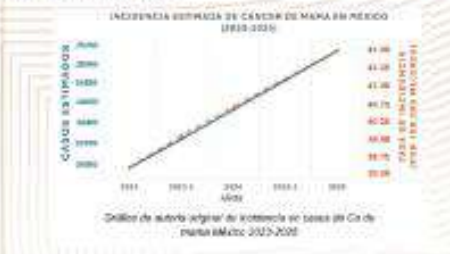


Datopotamab deruxtecan: hope against metastatic triple-negative breast cancer

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INTRODUCTION

Breast cancer is the most common cancer in women and the second leading cause of cancer-related death. It is classified into four molecular subtypes: basal, luminal, HER2, and triple-negative. The latter lacks hormonal receptors and HER2, affects younger women more frequently, and has a poorer prognosis. Although treatments were previously focused on tumors with receptors, advances in monoclonal antibodies and new targets such as TROP-2 have expanded therapeutic options. In January 2023, the FDA approved Dato-DXd for metastatic or unresectable HER2-negative breast cancer resistant to treatment, representing a significant therapeutic advance.



MECHANISM OF ACTION



RESULTS

According to clinical studies, Dato-DXd demonstrated superiority over conventional chemotherapy in advanced breast cancer, particularly in the HR+/HER2-negative and triple-negative subtypes. Due to its efficacy and greater tolerability, it is used as a superior alternative to chemotherapy in previously treated patients.

DATOPOTAMAB DERUXTECAN	QUIMIOTERAPIA CONVENCIONAL
Supervivencia Libre de Progresión 6.8 meses	Supervivencia Libre de Progresión 4.8 meses
Tasa de respuesta objetiva 38%	Tasa de respuesta objetiva 27%
Tasa de respuesta por ciclo 14.9%	Tasa de respuesta por ciclo 12.4%
Supervivencia Global 18.6 meses	Supervivencia Global 15.2 meses
Eventos Adversos de grado 3/4 21%	Eventos Adversos de grado 3/4 49%

OBJETIVE

To present Datopotamab deruxtecan as an emerging and promising treatment option for triple-negative breast cancer, given the scarcity of effective therapeutic alternatives, also highlighting its advantages, particularly its selective chemotherapeutic action against affected cells.

METHODOLOGY



CONCLUSIONS

Triple-negative breast cancer continues to be a major clinical challenge due to its aggressiveness and the limited availability of targeted treatments. In this context, datopotamab deruxtecan emerges as an innovative therapeutic option thanks to its mechanism directed against TROP2, allowing selective action on tumor cells with lower systemic toxicity. Preliminary results support its potential to improve disease control, representing a real hope for patients with limited therapeutic options.

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Case report: atypical appendicitis secondary to analgesic use

Reporte de caso: apendicitis atípica secundaria al uso de analgésicos

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Abstract

Acute appendicitis is the leading cause of surgical acute abdomen; however, its clinical presentation may vary and, in atypical cases, hinder timely diagnosis. The indiscriminate use of analgesics and anti-inflammatory drugs can mask classic symptoms, delay identification of the infectious source, and increase the risk of severe complications. The objective of this report was to describe a case of atypical appendicitis with a fatal outcome, highlighting the impact of clinical masking on the patient's course. The case involves a 31-year-old woman with a history of systemic arterial hypertension who initially sought medical care for nonspecific symptoms such as headache, dizziness, nausea, and a prior febrile episode, and was treated symptomatically. She subsequently presented to the emergency department in septic shock, without typical abdominal pain or clear signs of peritoneal irritation. Laboratory studies revealed severe metabolic acidosis, hyperlactatemia, and acute kidney injury. Abdominal computed tomography demonstrated a periappendicular collection when multiorgan damage was already irreversible. Despite advanced resuscitative management, the patient progressed to cardiopulmonary arrest and died. This case demonstrates that appendicitis may present in an atypical and fulminant manner when initial symptoms are masked, underscoring the importance of maintaining a high index of clinical suspicion and performing early, comprehensive evaluation in patients with signs of sepsis of unclear origin.

Keywords: atypical appendicitis; acute abdomen; septic shock; clinical masking; case report

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Resumen

La apendicitis aguda es la principal causa de abdomen agudo quirúrgico; sin embargo, su presentación clínica puede variar y, en casos atípicos, dificultar el diagnóstico oportuno. El uso indiscriminado de analgésicos y antiinflamatorios puede enmascarar los síntomas clásicos, retrasar la identificación de la fuente infecciosa y aumentar el riesgo de complicaciones graves. El objetivo de este reporte fue describir un caso de apendicitis atípica con desenlace fatal, destacando el impacto del enmascaramiento clínico en la evolución del paciente. Se presenta el caso de una mujer de 31 años con antecedente de hipertensión arterial sistémica, quien acudió inicialmente por síntomas inespecíficos como cefalea, mareo, náuseas y fiebre previa, siendo tratada de forma sintomática. Posteriormente ingresó a urgencias en estado de choque séptico, sin dolor abdominal típico ni signos claros de irritación peritoneal. Los estudios de laboratorio evidenciaron acidosis metabólica grave, hiperlactatemia y lesión renal aguda. La tomografía abdominal reveló una colección periapendicular cuando el daño multiorgánico ya era irreversible. A pesar del manejo con reanimación avanzada, la paciente evolucionó a paro cardiorrespiratorio y falleció. Este caso demuestra que la apendicitis puede presentarse de forma atípica y fulminante cuando los síntomas son enmascarados, lo que resalta la importancia de mantener un alto índice de sospecha clínica y de realizar una evaluación integral temprana en pacientes con datos de sepsis de origen no claro.

Palabras clave: apendicitis atípica; abdomen agudo; choque séptico; enmascaramiento clínico; reporte de caso





Case report: atypical appendicitis secondary to analgesic use

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INTRODUCTION

Acute appendicitis is the leading cause of surgical acute abdomen, characterized by inflammation of the vermiform appendix. Its manifestations include abdominal pain that migrates to the right lower quadrant (RLQ), nausea, vomiting, fever, and signs of peritoneal irritation. The indiscriminate use of analgesics and anti-inflammatory drugs may alter the symptoms, hinder timely diagnosis, and increase the risk of serious or even fatal complications.

CLINICAL CASE

A 31-year-old female with a history of hypertension presents to a Family Medicine Unit (FMU) with headache, ear pain, dizziness, and nausea, with a history of fever four days prior; she was treated symptomatically and discharged home.

31/07 Current medical condition: weakness, "diarrhea," and a sensation of dyspnea. Reevaluation: no improvement and presence of syncope.

01/08/2024

00:54 h She was admitted to the emergency department. Blood pressure: 82/62 mmHg, heart rate: 117 bpm. She presented asthenia, somnolence, nausea, and dehydration, with no respiratory or abdominal signs.

06:00 h Afebrile, with mucoid vomiting, lumbar pain, mild pain in the right iliac fossa, and anuria.

10:40 h Diagnosis: septic shock and acute kidney injury (AKI), with hyperlactatemia and high anion gap metabolic acidosis.

12:06 h Poor response to vasopressors. Request for abdominal CT scan.

12:35 h Sudden abdominal pain and a sensation of restlessness. Managed with an opioid.

16:05 h SpO₂ 89%, periods of apnea. A CT report was received: collection in the right iliac fossa (appendiceal process).

16:14 h Neurological deterioration and witnessed cardiorespiratory arrest.

16:39 h Death declared after 45 minutes of basic and advanced resuscitation.



Image 3: Abdominal CT scan with soft tissue window.



Scan the QR code to access the CT scan.



Scan the QR code to access the laboratory results.

DISCUSSION

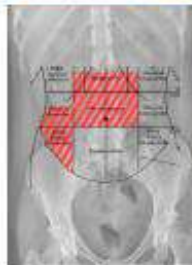


Image 4: Classic presentation of acute appendicitis begins with periumbilical pain that migrates to the right iliac fossa, reflecting irritation of the parietal peritoneum and guiding the clinical diagnosis.

Atypical Presentation - Self-medication
Young woman with hypertension, presenting after a mild viral infection.

Rapid deterioration: previous symptoms (diarrhea, syncope), with no improvement within 24 hours.

SLAB: Hypotension and tachycardia, without appendiceal signs.

CRITICAL PHASE

Diaper reflex	Hypertension (SLAB)	Urinary renal signs
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DOLOR ABDOMINAL SÚBITO

16:05 - 16:39 h: Neurological deterioration, apnea, and cardiorespiratory arrest.

DIAGNOSTIC TESTS



Image 1: Posteroanterior (PA) chest radiograph.

Image 2: Abdominal radiograph.

CONCLUSIONS

The fatal outcome was secondary to refractory septic shock originating from complicated appendicitis (periappendiceal collection). The key element of this case lies in the clinical masking of the septic source:

Absence of Typical Pain: The lack of abdominal pain and signs of peritoneal irritation at admission, possibly due to the mitigating effect of previously administered medications or the neurological depression induced by severe shock, delayed etiological confirmation.

Irreversibility of Damage: When the collection was identified by CT scan, the patient already presented metabolic acidosis and uncontrollable multiorgan damage (pH 6.8), making advanced resuscitation management insufficient.

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From suspected ruptured ectopic pregnancy to the finding of grade III pelvic inflammatory disease: differential diagnosis in gynecological acute abdomen

De la sospecha de embarazo ectópico roto al hallazgo de EPI grado III: diagnóstico diferencial en abdomen agudo ginecológico

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Abstract

Gynecological acute abdomen represents a significant diagnostic challenge due to the clinical overlap of various potentially life-threatening conditions. Ectopic pregnancy, defined as implantation of the blastocyst outside the endometrial cavity, and tubo-ovarian abscess, usually secondary to advanced pelvic inflammatory disease, share clinical manifestations such as pelvic pain, peritoneal irritation, and systemic involvement, which may hinder timely differentiation. The objective of this report was to describe a clinical case involving the coexistence of a left tubo-ovarian abscess and a contralateral incipient ectopic pregnancy, highlighting the diagnostic and surgical challenges in the management of gynecological acute abdomen. An observational, descriptive, and retrospective case report was conducted, based on a review of the medical record, imaging studies, and surgical findings of a 19-year-old female patient treated at a secondary-level hospital. The patient presented with hypogastric and left iliac fossa pain, scant transvaginal bleeding, and a positive immunological pregnancy test, initially suggesting a ruptured ectopic pregnancy. However, during exploratory laparotomy, a left tubo-ovarian abscess secondary to grade III pelvic inflammatory disease was identified, coexisting with an incipient ectopic pregnancy in the contralateral fallopian tube. This case illustrates the diagnostic complexity of gynecological acute abdomen and underscores the importance of comprehensive assessment, careful interpretation of clinical and paraclinical findings, and timely surgical intervention to prevent septic complications and preserve fertility.

Keywords: ectopic pregnancy; tubo-ovarian abscess; gynecological acute abdomen; pelvic inflammatory disease; case report

Resumen

El abdomen agudo ginecológico representa un reto diagnóstico significativo debido a la superposición clínica de diversas entidades potencialmente graves. El embarazo ectópico, definido como la implantación del blastocisto fuera de la cavidad endometrial, y el absceso tubo-ovárico, generalmente secundario a enfermedad pélvica inflamatoria avanzada, comparten manifestaciones clínicas como dolor pélvico, irritación peritoneal y compromiso sistémico, lo que puede dificultar su diferenciación oportuna. El objetivo de este reporte fue describir un caso clínico de coexistencia entre absceso tubo-ovárico izquierdo y embarazo ectópico incipiente contralateral, destacando los retos diagnósticos y quirúrgicos en el manejo del abdomen agudo ginecológico. Se realizó un estudio observacional, descriptivo y retrospectivo tipo reporte de caso, basado en la revisión del expediente clínico, estudios de gabinete y hallazgos quirúrgicos de una paciente femenina de 19 años atendida en un hospital de segundo nivel. La paciente ingresó con dolor hipogástrico y en fosa iliaca izquierda, sangrado transvaginal escaso y prueba inmunológica de embarazo positiva, lo que orientó inicialmente al diagnóstico de embarazo ectópico roto. Sin embargo, durante la laparotomía exploradora se identificó un absceso tubo-ovárico izquierdo secundario a enfermedad pélvica inflamatoria grado III, coexistiendo con un embarazo ectópico incipiente en la trompa contralateral. Este caso evidencia la complejidad diagnóstica del abdomen agudo ginecológico y subraya la importancia de una valoración integral, interpretación cuidadosa de los hallazgos clínicos y paraclínicos, así como una intervención quirúrgica oportuna para prevenir complicaciones sépticas y preservar la fertilidad.

Palabras clave: embarazo ectópico; absceso tubo-ovárico; abdomen agudo ginecológico; enfermedad pélvica inflamatoria; reporte de caso

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From suspected ruptured ectopic pregnancy to the finding of grade III pelvic inflammatory disease: differential diagnosis in gynecological acute abdomen

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INTRODUCTION

Ectopic pregnancy is defined as the implantation of the blastocyst outside the endometrial cavity, most commonly in the fallopian tube, and constitutes a prevalent cause of gynecological acute abdomen during the first trimester of pregnancy. A tubo-ovarian abscess, on the other hand, corresponds to an adnexal purulent collection, generally secondary to stage III pelvic inflammatory disease, of polymicrobial etiology. Both conditions may present with severe pelvic pain, signs of peritoneal irritation, and systemic involvement. (1-3)

OBJETIVE

To describe a clinical case of coexistence between a left tubo-ovarian abscess and an early contralateral ectopic pregnancy, highlighting the diagnostic and surgical challenges in the management of gynecological acute abdomen.

METHODOLOGY

An observational, descriptive, and retrospective study was conducted as a case report, based on the review of the clinical record, imaging study results, and surgical findings of the patient treated in the Gynecology and Obstetrics Service of the General Hospital of Tampico "Dr. Carlos Canseco", during October 2025. During the surgical intervention, the anatomical findings were documented through photographic records and operative description, confirming a left tubo-ovarian abscess secondary to grade III pelvic inflammatory disease and an incipient ectopic pregnancy in the contralateral fallopian tube.

CASE PRESENTATION

Female, 19 years old, single, religion denied. Vital signs: BP 120/70 mmHg, RR 16 breaths/min, HR 86 bpm, SpO₂ 98%.

Family history: Mother deceased at 32 years of age, cause unknown. Father alive, 35 years old, apparently healthy; chronic-degenerative diseases denied.

Non-pathological personal history: Alcohol use (+), initiated at 15 years of age. Tobacco use (+), initiated at 13 years of age, 5 cigarettes per day. Substance use (+), initiated at 10 years of age, 10 marijuana cigarettes per day; cocaine use for the past month, twice per week. Balanced diet three times per day. Tattoos (+), 10 in multiple areas of the body.

Pathological personal history: No relevant data.

Gynecological and obstetric history:

Menarche at 10 years of age. Regular menstrual cycles 25 x 4. First sexual intercourse at 14 years of age. Number of sexual partners: 6. Family planning methods: denied. Pap smear (-). DOCMA (-). Last menstrual period (LMP): 24.09.25, G1.

Reason for consultation: The patient presents to the emergency department due to hypogastric and left iliac fossa pain of nine days of evolution, with sudden onset, progressive course, radiating to the lumbar and sacral regions, associated with scant transvaginal bleeding and general malaise. She reports a positive rapid pregnancy test prior to admission. She denies fever, vomiting, or heavy bleeding.

Physical examination: Patient conscious, oriented, and hemodynamically stable. Abdomen soft and depressible, with intense pain on deep palpation in the left iliac fossa, positive Blumberg sign, localized muscular guarding, and pain upon decompression. On gynecological examination, genitalia appropriate for age and sex, posterior closed, and formed cervix, with scant bloody staining on the glove. Posterior fornix bulging and pain with cervical motion.

Transvaginal pelvic ultrasound: Uterus in anteflexion measuring 7 x 3 mm, endometrial line of 3.5 mm, and abundant free fluid in the pelvic cavity and pouch of Douglas, predominantly in the left adnexa, with tubal thickening. A diagnosis of probable ruptured ectopic pregnancy in the left fallopian tube was established, and urgent exploratory laparotomy was indicated.

RESULTS



DISCUSSION

The patient was admitted with an acute abdomen, free fluid in the left adnexa, signs of peritoneal irritation, and a positive immunological pregnancy test (IPT), findings that initially suggested a ruptured ectopic pregnancy in the left fallopian tube. However, during laparotomy, a left tubo-ovarian abscess secondary to grade III pelvic inflammatory disease was identified, coexisting with an incipient pregnancy in the contralateral fallopian tube, which explained the positive IPT. This case highlights the diagnostic complexity of gynecological acute abdomen, in which the simultaneous presence of inflammatory processes and early implantation may mask the true etiology. The coexistence of advanced PID and an incipient pregnancy represents a significant clinical challenge that requires a comprehensive evaluation, careful interpretation of clinical and paraclinical findings, and timely surgical decision-making in order to avoid adverse outcomes.

CONCLUSIONS

The simultaneous presence of a tubo-ovarian abscess and an incipient ectopic pregnancy represents a significant diagnostic challenge. This case underscores the importance of a comprehensive evaluation, the timely use of imaging studies, and early surgical exploration, especially in young patients with risk factors and an ambiguous clinical presentation. Early recognition of coexisting pathologies may prevent septic complications and help preserve fertility.

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Therapeutic modalities for the remission of type 2 diabetes mellitus: a systematic review

Modalidades terapéuticas para la remisión de diabetes mellitus tipo 2: revisión sistemática

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Abstract

Type 2 diabetes mellitus represents a major global public health problem due to its high prevalence and the associated microvascular and macrovascular complications. In recent years, the concept of disease remission has gained increasing relevance, prompting the evaluation of therapeutic modalities beyond conventional glycemic control. The objective of this systematic review was to analyze the main therapeutic strategies associated with remission of type 2 diabetes mellitus and to compare their clinical effectiveness. A systematic review of the scientific literature was conducted in accordance with PRISMA guidelines, including clinical trials, observational studies, and systematic reviews that assessed intensive lifestyle interventions, pharmacological therapies, and metabolic surgery. The results showed that significant weight loss, achieved through structured dietary interventions or bariatric surgery, was associated with higher and more sustained remission rates. Additionally, certain pharmacological regimens demonstrated partial benefits, particularly when implemented early in the course of the disease. Overall, the evidence suggests that remission of type 2 diabetes mellitus is an achievable goal in selected patients, especially when intensive and individualized therapeutic strategies are applied, highlighting the importance of an early and comprehensive approach to disease management

Keywords: type 2 diabetes mellitus; diabetes remission; therapeutic modalities; weight loss; systematic review

Resumen

La diabetes mellitus tipo 2 representa uno de los principales problemas de salud pública a nivel mundial debido a su elevada prevalencia y a las complicaciones micro y macrovasculares asociadas. En los últimos años, el concepto de remisión de la enfermedad ha cobrado relevancia, impulsando la evaluación de distintas modalidades terapéuticas más allá del control glucémico convencional. El objetivo de esta revisión sistemática fue analizar las principales estrategias terapéuticas asociadas con la remisión de la diabetes mellitus tipo 2 y comparar su efectividad clínica. Se realizó una revisión sistemática de la literatura científica siguiendo las directrices PRISMA, mediante la búsqueda de estudios publicados en bases de datos biomédicas reconocidas. Se incluyeron ensayos clínicos, estudios observacionales y revisiones sistemáticas que evaluaron intervenciones como cambios intensivos en el estilo de vida, terapias farmacológicas y cirugía metabólica. Los resultados evidenciaron que la pérdida de peso significativa, lograda mediante intervención dietética estructurada o cirugía bariátrica, se asocia con mayores tasas de remisión sostenida. Asimismo, ciertos esquemas farmacológicos mostraron beneficios parciales, especialmente cuando se implementan de forma temprana. En conjunto, la evidencia sugiere que la remisión de la diabetes mellitus tipo 2 es un objetivo alcanzable en pacientes seleccionados, particularmente cuando se emplean estrategias terapéuticas intensivas e individualizadas, lo que resalta la necesidad de un abordaje integral y oportuno en el manejo de la enfermedad.

Palabras clave: diabetes mellitus tipo 2; remisión de la diabetes; modalidades terapéuticas; pérdida de peso; revisión sistemática

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Therapeutic modalities for the remission of type 2 diabetes mellitus: a systematic review

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) continues to be a public health problem worldwide. According to available information, some therapeutic regimens have been associated with its remission, defined by the WHO and the ADA as normal glucose levels (HbA1c < 6.5%) sustained for at least three months without pharmacological treatment.

OBJETIVE

To analyze the available information on therapeutic modalities for the remission of type 2 diabetes

METHODOLOGY

A search was conducted in different databases such as PubMed to identify updated information obtained through the development of research based on the scientific method. Keywords and Boolean connectors were used: (diabetes) AND (remission).

RESULTS

Eight articles were selected for analysis: seven randomized controlled trials (RCTs) and one meta-analysis.

Título	Autor/As	Conclusiones
Tratamiento de un servicio de atención primaria estructurada de remisión de diabetes implementado en atención primaria en familia, atención peso, glucemia, calidad de vida y gastos dispensación a pagar por los suplementos alimenticios	Chirreaya R. et al. 2024	La aplicación de un servicio estructurado de remisión de diabetes implementado en atención primaria en familia, atención peso, glucemia, calidad de vida y gastos dispensación a pagar por los suplementos alimenticios
Dapagliflozina vs dieta controlada calórica para la remisión de la diabetes tipo 2: ensayo multicéntrico, doble ciego, aleatorizado y controlado con placebo	Liu Y. et al. 2021	Dapagliflozina con restricción calórica logró un 44% de remisión de diabetes frente al 24% con placebo
Efecto de la restricción calórica en comparación con la dieta balanceada o la restricción balanceada sobre la remisión de la diabetes tipo 2: una revisión sistemática	Jeyidi A. et al. 2023	Las dietas con restricción calórica pueden ser una intervención eficaz para la remisión y reducen el consumo de un programa sostenido de modificación del estilo de vida
Remisión de la diabetes en la diabetes mellitus tipo 2 de reciente diagnóstico mediante terapia intensiva de insulina subcutánea continua de liberación a corto plazo combinada con un tratamiento de dieta baja en carbohidratos	Huang X. et al. 2021	El tratamiento intensivo logró una remisión del 93% frente al 3% del tratamiento con insulina
Título	Autor/As	Conclusiones
La firma metabólica de la pérdida de peso y la remisión en el ensayo clínico de remisión de la diabetes (DIRECT)	Corbin L. et al. 2024	El cambio de peso se correlaciona con el cambio general en el perfil metabólico asociado con la intervención
Remisión de la diabetes mediante cirugía bariátrica y tratamientos no quirúrgicos en pacientes con diabetes tipo 2 que no cumplen los criterios para la cirugía: una revisión sistemática y meta-análisis	Zhou X. et al. 2023	La cirugía bariátrica demostró ser significativamente más efectiva para lograr la remisión de la diabetes
Evolución temporal de la normalización de la capacidad funcional de las células β en el ensayo clínico de remisión de la diabetes tras la pérdida de peso en la diabetes tipo 2	Zhezhongkang S. et al. 2020	Tras la pérdida de peso, se observó un aumento gradual de la capacidad funcional de las células β, equiparado a la de los participantes del grupo NDC a los 12 meses
Tratamiento de un servicio de atención primaria estructurada de remisión de diabetes en la atención primaria en familia: atención peso, glucemia, calidad de vida y gastos dispensación a pagar por los suplementos alimenticios	Chirreaya R. et al. 2024	La aplicación de un servicio estructurado de remisión de diabetes implementado en atención primaria en familia, atención peso, glucemia, calidad de vida y gastos dispensación a pagar por los suplementos alimenticios

CONCLUSIONS

The therapeutic modalities that allow the remission of type 2 diabetes mellitus (T2DM) are based on intensive interventions and lifestyle modifications. However, the evidence does not allow the conclusion that all patients achieve remission due to different factors that have been studied and other factors that remain unknown, which require further investigation through longitudinal and prospective research studies..

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Social media and mental health: a documentary analysis of its impact on psychological well-being

Redes sociales y salud mental: análisis documental de su impacto en el bienestar psicológico

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Abstract

Technological advancements have significantly transformed communication and social interaction, positioning social media as central elements in everyday life. However, their intensive use has raised growing concerns about their impact on mental health, especially in younger populations. The aim of this study was to analyze the effect of social media use on mental health and psychological well-being, based on the available scientific evidence. A documentary, non-experimental, qualitative research approach was conducted, based on the review and critical analysis of academic literature published between 2018 and 2025 in peer-reviewed and indexed scientific sources. The results revealed a duality in the effects of social media use. Positive effects included the strengthening of social support, self-expression, identity building, and a sense of belonging, particularly in contexts of isolation. However, excessive and unregulated use was associated with anxiety, depression, decreased self-esteem, insomnia, digital fatigue, and technological dependence, primarily related to constant social comparison and prolonged exposure to idealized content. Overall, the findings suggest that the impact of social media on mental health is neither inherently positive nor negative, but depends on usage time, type of interaction, purpose of content consumption, and emotional self-regulation skills. These results emphasize the importance of promoting digital literacy, mindful use of digital platforms, and preventive strategies aimed at protecting mental health and fostering a healthy balance between digital life and psychological well-being.

Keywords: social media; mental health; psychological well-being; social comparison; digital literacy

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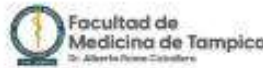
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Resumen

Los avances tecnológicos han transformado de manera significativa las formas de comunicación e interacción social, posicionando a las redes sociales como elementos centrales en la vida cotidiana. No obstante, su uso intensivo ha generado crecientes preocupaciones respecto a su impacto en la salud mental, especialmente en poblaciones jóvenes. El objetivo de este estudio fue analizar el efecto del uso de las redes sociales sobre la salud mental y el bienestar psicológico, a partir de la evidencia científica disponible. Se realizó una investigación documental, no experimental y de enfoque cualitativo, basada en la revisión y análisis crítico de literatura académica publicada entre 2018 y 2025 en fuentes científicas arbitradas e indexadas. Los resultados evidenciaron una dualidad en los efectos del uso de las redes sociales. Entre los efectos positivos se identificaron el fortalecimiento del apoyo social, la autoexpresión, la construcción de identidad y la sensación de pertenencia, particularmente en contextos de aislamiento. Sin embargo, el uso excesivo y no regulado se asoció con ansiedad, depresión, disminución de la autoestima, insomnio, fatiga digital y dependencia tecnológica, principalmente relacionados con la comparación social constante y la exposición prolongada a contenidos idealizados. En conjunto, los hallazgos sugieren que el impacto de las redes sociales en la salud mental no es intrínsecamente positivo ni negativo, sino que depende del tiempo de uso, el tipo de interacción, la finalidad del consumo de contenidos y las habilidades de autorregulación emocional del usuario. Estos resultados subrayan la importancia de promover la alfabetización digital, el uso consciente de las plataformas digitales y estrategias preventivas orientadas a proteger la salud mental y fomentar un equilibrio saludable entre la vida digital y el bienestar psicológico.

Palabras clave: redes sociales; salud mental; bienestar psicológico; comparación social; alfabetización digital





Social Media and Mental Health: A Documentary Analysis of Its Impact on Psychological Well-Being
Redes sociales y salud mental: análisis documental de su impacto en el bienestar psicológico

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INTRODUCTION

Technological advances have transformed communication and the way people interact. Social media platforms such as Facebook, Instagram, TikTok, and X have brought millions of users closer together around the world, but they have also raised concerns about their impact on mental health.

Young people, in particular, being the most active users on these platforms, may experience effects such as anxiety, depression, or low self-esteem.

Therefore, this study analyzes how the intensive use of social media influences emotional well-being and seeks to promote a more conscious and balanced use of technology.

OBJETIVE

General Objective

To analyze, through documentary research, the impact of social media use on mental health and psychological well-being based on the critical review of recent academic sources.

Specific Objectives

- To identify the main factors associated with social media use that influence mental health.
- To examine the positive and negative effects reported in the scientific literature regarding social media use.
- To describe the population groups most vulnerable to the adverse effects of excessive social media use.
- To evaluate the strategies proposed in previous research to promote healthy and responsible use of these digital platforms.

RESULTS

The results obtained from the documentary analysis reveal a series of both positive and negative elements regarding the use of social media.

Regarding the positive and negative effects of social media use, the analysis of the literature made it possible to identify a duality in the effects of social media on mental health.

Positive effects:

- Social media can serve as spaces for emotional support, especially in contexts of isolation or crisis, as observed during the COVID-19 pandemic (Soto & Muñoz, 2022).
- They promote self-expression and personal identity, allowing users to share experiences, interests, and opinions (Gómez & Cárdenas, 2023).
- They encourage social interaction and a sense of belonging, reducing feelings of loneliness when used consciously (UNSA, 2021).

Negative effects:

- Excessive use can lead to digital fatigue, insomnia, anxiety, and depression (Martínez Soler, 2021; López & Paredes, 2022).
- Constant social comparison and exposure to unattainable ideals of success or beauty can decrease self-esteem and increase body dissatisfaction (Valenzuela et al., 2021).
- An increase in technological dependence and a sense of emotional isolation has been observed, even while being "connected" with other people (Gómez & Cárdenas, 2023).

These findings demonstrate that the impact of social media is not intrinsically negative or positive, but rather depends on the balance between time of use, the purpose of connection, and the user's ability to manage their emotions when interacting with digital content.

METHODOLOGY

The present research adopts a documentary design with a qualitative approach, focused on the review, analysis, and synthesis of information obtained from peer-reviewed and indexed academic and scientific sources related to the impact of social media on mental health, published between 2018 and 2023. The main objective is to gather, contrast, and interpret the theoretical and empirical findings reported in previous studies in order to identify the main risk and protective factors associated with social media use and their influence on psychological well-being.

The study is non-experimental, since variables are not manipulated and there is no direct intervention on a population. Instead, the results of previously conducted research are analyzed, which allows conclusions to be generated based on existing knowledge and provides an integrative perspective on the phenomenon.

CONCLUSIONS

In conclusion, social media can be a very powerful tool for connecting with others, learning new things, and expressing our ideas and emotions. However, it also represents a risk if it is used without control or without awareness of the impact it can have on our daily lives. Balance is essential: it is necessary to take advantage of the benefits of these platforms without allowing them to affect our mental health, our emotions, or our social relationships in real life.

Therefore, it is crucial to promote awareness about the use of social media and to learn how to establish healthy digital habits. This includes recognizing personal limits, prioritizing face-to-face relationships, reflecting on the content we consume and share, and paying attention to warning signs in ourselves and in those around us. Likewise, it is necessary to promote digital education from an early age, so that new generations learn how to manage these tools without compromising their emotional well-being.

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Psychodermatology in psoriasis and atopic dermatitis: the link between mind and skin

Psicodermatología en psoriasis y dermatitis atópica: el vínculo entre mente y piel

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Abstract

Psoriasis and atopic dermatitis (AD) are chronic inflammatory diseases that illustrate the interaction between the immune system, the nervous system, and psychoemotional factors, forming the skin-brain-immune axis, a fundamental concept in psychodermatology. Chronic stress and activation of the hypothalamic-pituitary-adrenal (HPA) axis disrupt immune-neuroendocrine regulation, promoting the release of pro-inflammatory cytokines and worsening skin dysfunction. In psoriasis, the Th1/Th17 pathway predominates, while in AD, the Th2 pathway is more active, both associated with emotional disorders such as anxiety, depression, and insomnia. The aim of the study was to analyze the psycho-neuro-immune interaction in these diseases to propose a patient stratification model that guides personalized therapies within the framework of precision medicine. A narrative review was conducted with a systematic search of the literature in databases such as PubMed, SciELO, Scopus, and Web of Science, considering articles published between 2020 and 2025 that explored the relationship between stress, the HPA axis, immune pathways, and skin manifestations. The results showed that stress and HPA axis dysfunction are closely related to skin inflammation in both diseases, with psoriasis dominated by the Th1/Th17 pathway and AD by the Th2 pathway. The evidence supports the need for an integration of immune and emotional approaches in the management of psoriasis and AD, enabling a more effective and personalized treatment that addresses both the physiological and psychoemotional aspects of patients.

Keywords: psychodermatology; psoriasis; atopic dermatitis; chronic stress; precision medicine

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Resumen

La psoriasis y la dermatitis atópica (DA) son enfermedades inflamatorias crónicas que ilustran la interacción entre el sistema inmunitario, el sistema nervioso y factores psicoemocionales, formando el eje piel-cerebro-inmunidad, concepto fundamental en la psicodermatología. El estrés crónico y la activación del eje hipotálamo-hipófisis-adrenal (HPA) alteran la regulación inmunoneuroendocrina, lo que favorece la liberación de citoquinas proinflamatorias y agrava la disfunción cutánea. En la psoriasis, la vía Th1/Th17 predomina, mientras que en la DA, la vía Th2 está más activa, ambas asociadas con trastornos emocionales como ansiedad, depresión e insomnio. El objetivo del estudio fue analizar la interacción psico-neuro-inmunológica en estas enfermedades para proponer un modelo de estratificación de pacientes, que oriente terapias personalizadas dentro del marco de la medicina de precisión. Se realizó una revisión narrativa con búsqueda sistemática de la literatura en bases de datos como PubMed, SciELO, Scopus y Web of Science, considerando artículos publicados entre 2020 y 2025 que exploraran la relación entre el estrés, el eje HPA, las vías inmunes y las manifestaciones cutáneas. Los resultados mostraron que el estrés y la disfunción del eje HPA están estrechamente relacionados con la inflamación cutánea en ambas enfermedades, con la psoriasis dominada por la vía Th1/Th17 y la DA por la vía Th2. La evidencia respalda la necesidad de una integración de enfoques inmunológicos y emocionales en el manejo de la psoriasis y la DA, permitiendo un tratamiento más eficaz y personalizado que aborde tanto los aspectos fisiológicos como los psicoemocionales de los pacientes.

Palabras clave: psicodermatología; psoriasis; dermatitis atópica; estrés crónico; medicina de precisión



Psychodermatology in psoriasis and atopic dermatitis: the link between mind and skin

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INTRODUCTION

Psoriasis and atopic dermatitis (AD) are chronic inflammatory diseases that illustrate the complex interaction between the immune system, the nervous system, and psychosocial factors, forming the skin-brain-immunity axis, the foundation of modern psychodermatology. Chronic stress and activation of the hypothalamic-pituitary-adrenal (HPA) axis alter immunoregulatory mechanisms, promoting the release of pro-inflammatory cytokines that worsen skin dysfunction. In psoriasis, the Th1/Th17 pathway predominates, while in AD the Th2 pathway is predominant, both are associated with anxiety, depression, and insomnia.

However, current literature addresses these factors separately, which limits the development of integrated models. This study proposes a precision psychodermatology approach, aimed at personalizing therapeutic strategies according to the patient's immunopsychological profile.

OBJETIVE

General Objective:

To analyze the psycho-neuro-immunological interaction in psoriasis and atopic dermatitis in order to propose a patient stratification model that guides personalized therapies within the framework of precision medicine.

Specific Objectives:

- To correlate the clinical severity of the disease with immunological profiles (Th1/Th17 and Th2) and the patient's psychological burden (stress, anxiety, depression).
- To identify the dysregulation of the Hypothalamic-Pituitary-Adrenal (HPA) axis as the key biological mechanism linking stress with cutaneous inflammation.
- To structure a psychodermatological care model that integrates these findings in order to personalize the therapeutic approach.

METHODOLOGY

- Type of study:** narrative bibliographic review with systematic search and an analytical-descriptive approach.
- Sources of information:** PubMed, Scielo, Scopus, and Web of Science (period: 2020-2023).
- Inclusion criteria:** studies in English or Spanish, peer-reviewed, that analyzed the relationship between stress, the HPA axis, immune pathways (Th1/Th17 and Th2), and cutaneous manifestations in psoriasis and atopic dermatitis.
- Selection:** 35 articles were selected and organized into matrices (Excel, Mendeley, Zotero).
- Analysis:** through narrative synthesis and theoretical triangulation among the immunological, dermatological, and psychological axes, integrating the findings into an immunopsychological stratification model oriented toward precision medicine.

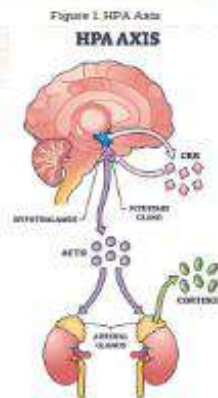


Figure 1. HPA Axis

RESULTS

The review identified a bidirectional relationship between stress, dysregulation of the HPA axis, and cutaneous inflammation. Psoriasis showed a predominance of Th1/Th17 pathways, while atopic dermatitis showed predominance of Th2, both associated with symptoms of anxiety, depression, and insomnia. Recent studies confirm that chronic stress increases IL-6, TNF- α , and cortisol, reinforcing the mind-skin connection. The integration of immunological and emotional variables allows the delineation of differentiated immunopsychological profiles, which form the basis for clinical stratification in precision medicine.

Table 1. Differential Immuno-Psychological Profiles

Characteristic	Psoriasis	Atopic Dermatitis
Immune Pathway	Th1/Th17	Th2
Key Mediators	IL-17, TNF- α	IL-4, IL-13
Psychological Comorbidity	Depression	Anxiety, Sleep Disorders
Model	Psychodermatological Amplification	Pruritus-Scratch Cycle

Figure 2. Psycho-Neuro-Immunological Feedback Loop Model



Figure 3. Plaque of Psoriasis Vulgaris



CONCLUSIONS

The integration between the mind, skin, and immune system redefines the understanding of inflammatory skin diseases. Beyond describing correlations, this analysis proposes a paradigm shift: recognizing that the psychological component is not merely an accessory factor, but a central biological modulator.

Psychodermatology, supported by precision medicine, offers the possibility of stratifying patients according to their immunopsychological profile and guiding interventions that balance both the inflammatory response and emotional well-being. This approach inaugurates a more human, predictive, and personalized vision of dermatological care.

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Stress levels and academic performance: an analysis in medical students during departmental exams

Nivel de estrés y rendimiento académico: un análisis en estudiantes de medicina frente a exámenes departamentales

Amairani Castillo Perales, Candy Guadalupe Meza Caballero, Daniela Constanza Orozco Jiménez, Carlos Andrés Sánchez Maya, Dra. María Elena Calles Santoyo*

Abstract

Stress is a natural response of the body to situations that require adaptation, and in the academic context, particularly among medical students, it can become a persistent phenomenon that impacts emotional well-being and academic performance. This study aimed to analyze the relationship between stress levels and academic performance in students at the "Dr. Alberto Romo Caballero" Faculty of Medicine during departmental exams. A quantitative, descriptive, cross-sectional, and correlational study was conducted with a sample of 240 students selected through stratified random sampling. The stress subscale of the DASS-21 scale, validated in the Mexican population, was used, and academic performance data were obtained from the official averages provided by the Student Services. The results showed that women had significantly higher stress levels than men. Additionally, a significant positive correlation was observed between stress levels and academic performance ($Rho = 0.131, p = 0.04$), suggesting that moderate levels of stress may act as a stimulus to improve effort and concentration. However, elevated stress levels may have negative effects. These results underscore the importance of implementing stress management strategies, especially for women and students with high stress levels, to improve both their emotional well-being and academic performance.

Keywords: academic stress; academic performance; medical students; stress management; mental health

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Resumen

El estrés es una respuesta natural del organismo ante situaciones que requieren adaptación, y en el contexto académico, particularmente en los estudiantes de Medicina, puede convertirse en un fenómeno persistente que impacta el bienestar emocional y el rendimiento académico. Este estudio tuvo como objetivo analizar la relación entre el nivel de estrés y el rendimiento académico en estudiantes de la Facultad de Medicina "Dr. Alberto Romo Caballero" durante los exámenes departamentales. Se llevó a cabo un estudio cuantitativo, descriptivo, transversal y correlacional, con una muestra de 240 estudiantes seleccionados mediante muestreo aleatorio estratificado. Se utilizó la subescala de estrés de la Escala DASS-21, validada en población mexicana, y los datos de rendimiento académico fueron obtenidos de los promedios oficiales proporcionados por Servicios Escolares. Los resultados mostraron que las mujeres presentaron niveles de estrés significativamente más altos que los hombres. Además, se observó una correlación positiva significativa entre el nivel de estrés y el rendimiento académico ($Rho = 0.131, p = 0.04$), sugiriendo que un grado moderado de estrés puede actuar como un estímulo para mejorar el esfuerzo y la concentración. Sin embargo, niveles elevados de estrés pueden tener efectos negativos. Estos resultados subrayan la importancia de implementar estrategias de manejo del estrés, especialmente en mujeres y estudiantes con altos niveles de estrés, para mejorar tanto su bienestar emocional como su desempeño académico.

Palabras clave: estrés académico; rendimiento académico; estudiantes de medicina; manejo del estrés; salud mental





Stress levels and academic performance: an analysis in medical students during departmental exams

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Universidad Autónoma de Tamaulipas, Facultad de Medicina de Tampico "Dr. Alberto Romo Caballero"

INTRODUCTION

Stress is a natural response of the body in situations that require adaptation or effort. In the academic environment, this reaction can become a persistent phenomenon that affects both the emotional well-being and performance of students. Among medical students, stress is a frequent phenomenon due to the high level of commitment required to meet academic and professional goals. Analyzing the relationship between stress levels and academic performance among students of the Faculty of Medicine "Dr. Alberto Romo Caballero" is essential to understand the impact that departmental examinations have on their mental health and academic performance. This knowledge will allow not only the magnitude of the problem to be understood, but also the proposal of preventive and coping strategies that promote emotional balance and effective learning, which are necessary to achieve academic and professional goals.

OBJETIVE

General Objective:

To determine the relationship between the level of stress and the academic performance of students of the Faculty of Medicine "Dr. Alberto Romo Caballero" during departmental examinations.

Specific Objectives:

- To identify the sociodemographic characteristics of the students.
- To determine the level of stress among students during the departmental examination period.
- To determine the existing relationship between stress levels and academic performance.

METHODOLOGY

Study design: Quantitative, descriptive, cross-sectional, and correlational. It seeks to identify the relationship between stress level and academic performance during departmental examinations, without manipulating variables.

Population: Students enrolled in the Medical Degree program (UAT) during the August-December 2023 period. Estimated universe: 1300 students. **Sample:** 245 participants, selected through stratified random sampling by semester.

Instrument: The stress subscale of the DASS-21 (Depression Anxiety Stress Scales) will be used (Lovibond & Lovibond, 1995), validated in the Mexican population (González-Ramírez et al., 2020), with a Cronbach's alpha of 0.99. A total of 7 items (1, 5, 8, 11, 14, and 18) will be applied, rated on a Likert scale from 0 to 3, with interpretative ranges classified as mild, moderate, severe, and extremely severe stress.

Data collection: A digital survey administered through Google Forms, distributed via QR codes and social media. A digital informed consent form will be included prior to participation.

Academic performance: Official grade averages provided by the School Service Department, with guaranteed anonymity.

Analysis: SPSS v.27. Descriptive and inferential statistics will be used (Spearman or Pearson correlation, Student's t-test or Mann-Whitney U test depending on normality and group).

RESULTS

Differences in the diagnosis of stress according to gender

Variable	n	m	W	p-value	1-β power	Effect size
Male	64	89.17		.3827	0.007	0.48
Female	147	113.33				

The median stress level was higher in women (m = 113.33) compared with men (m = 89.17), which shows that there is a significant difference in the diagnosis of stress according to gender. The statistical power of the analysis was 0.48, representing a limited capacity to detect effects.

Differences in the diagnosis of stress according to place of origin

Variable	n	m	W	p-value	1-β power	Effect size
Local	139	101.47		4374.00	.128	.71
Non-local	72	114.75				

The comparison of stress diagnosis using the Mann-Whitney U test did not reveal significant differences. The statistical power of 71% suggests a moderate capacity to detect existing effects.

Differences in the diagnosis of stress according to the period

Variable	n	m	W	p-value	1-β power	Effect size
1-8	41	97.73		.146	.322	.47
9-18	170	107.98				

Students in higher semesters obtained a slightly higher mean stress level compared with those in earlier semesters; however, this difference was not statistically significant. The effect size and statistical power are low, representing a limitation in detecting existing effects.

Correlation between stress diagnosis and academic performance

Variable	Academic performance	p-value
Stress diagnosis	0.131	0.04

Note: statistical significance < 0.05*.

CONCLUSIONS

The results obtained in this study confirm that academic stress is a variable present in the majority of medical students. It was observed that women presented significantly higher levels of stress compared to men. However, no significant differences were found between groups according to age, place of origin, or academic semester. The positive and statistically significant correlation between stress levels and academic performance (Rho = 0.131, p = 0.04) suggests that a moderate level of stress may act as a stimulus that promotes effort and concentration, although higher levels could generate the opposite effect. In conclusion, understanding the relationship between stress and academic performance allows progress toward a more humane medical education, one that values not only technical knowledge but also the overall well-being of students as future healthcare professionals.

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Medical process simulation: a documentary analysis of its impact on health professional training

Simulación de procesos médicos: análisis documental de su impacto en la formación de profesionales de la salud

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Abstract

Highly competent in increasingly complex clinical scenarios, medical simulation has emerged as a key tool in this context. By utilizing computational models, artificial intelligence (AI), virtual reality (VR), and interactive three-dimensional environments, it allows for the recreation of clinical procedures in controlled settings, transforming errors into learning opportunities without risk to the patient. This methodology addresses the ethical and logistical limitations of practicing with real patients. The objective of this documentary research is to analyze the impact of medical simulation on the training of health science students, highlighting its pedagogical benefits, technological advancements, and challenges in its implementation. The research is descriptive and non-experimental, based on the review of academic sources published between 2005 and 2025. The results show that simulation significantly improves students' clinical competencies, such as technical skills, communication, decision-making, and teamwork. Furthermore, it accelerates skill acquisition, facilitates immediate feedback, error identification, and reduces stress. Despite technological advancements, challenges remain related to costs and integration with real healthcare systems. Future research should evaluate the impacts on patient care and the efficiency of the healthcare system.

Keywords: medical simulation; medical education; artificial intelligence; virtual reality; clinical competencies

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Resumen

La educación médica enfrenta el desafío de formar profesionales altamente competentes ante escenarios clínicos cada vez más complejos. En este contexto, la simulación de procesos médicos ha emergido como una herramienta clave. Utilizando modelos computacionales, inteligencia artificial (IA), realidad virtual (VR) y entornos tridimensionales interactivos, permite recrear procedimientos clínicos en entornos controlados, transformando el error en una oportunidad de aprendizaje sin riesgos para el paciente. Esta metodología responde a las limitaciones éticas y logísticas de la práctica con pacientes reales. El objetivo de esta investigación documental es analizar el impacto de la simulación médica en la formación de los estudiantes de ciencias de la salud, destacando sus beneficios pedagógicos, avances tecnológicos y desafíos en su implementación. La investigación es descriptiva y no experimental, basada en la revisión de fuentes académicas publicadas entre 2005 y 2025. Los resultados muestran que la simulación mejora significativamente las competencias clínicas de los estudiantes, como habilidades técnicas, comunicación, toma de decisiones y trabajo en equipo. Además, acelera la adquisición de habilidades, facilita la retroalimentación inmediata, la identificación de errores y reduce el estrés. A pesar de los avances tecnológicos, persisten desafíos relacionados con los costos y la integración con sistemas de salud reales. Las futuras investigaciones deben evaluar los impactos en la atención al paciente y la eficiencia del sistema de salud.

Palabras clave: simulación médica; educación médica; inteligencia artificial; realidad virtual; competencias clínicas





Medical process simulation: a documentary analysis of its impact on health professional training

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INTRODUCTION

Contemporary medical education faces the challenge of training highly competent professionals capable of effectively responding to increasingly complex clinical scenarios. In this context, medical process simulation has emerged as one of the most innovative and effective pedagogical strategies in health sciences education. Through computational models, artificial intelligence (AI), virtual reality (VR), and interactive three-dimensional environments, simulation allows the recreation of clinical procedures in controlled and safe settings, where errors become learning opportunities rather than risks to the patient (Muñoz Gualán & Sierra, 2024).

The integration of simulation into medical education addresses the need to effectively combine theory and practice, overcoming the ethical and logistical limitations associated with practicing on real patients (Vera-Carrasco, 2024).

METHODOLOGY

This work is a descriptive documentary research, as it is based on the collection, review, analysis, and interpretation of information from various academic sources related to medical simulation in the training of health professionals. The design is non-experimental and cross-sectional, as no variables are manipulated, and the analysis focuses on documents published within a specific period.

The population consists of the scientific production related to computational medical simulation and its application in health sciences education. The sample includes 30 documents selected from scientific articles, theses, books, and institutional reports published between 2005 and 2025, in both Spanish and English, that address theoretical, methodological, and applied aspects of medical simulation.

OBJETIVE

Analyze, through documentary research, the impact of medical simulation based on computational models on the academic and professional training of health science students, identifying its pedagogical benefits, technological advancements, and main implementation challenges.

RESULTS

The results of medical process simulation include a significant improvement in students' clinical competencies, encompassing the development of technical skills, communication, decision-making, and teamwork. Additionally, simulation accelerates skill acquisition, provides immediate feedback, facilitates error identification, reduces stress in high-pressure situations, and enhances customer care.

CONCLUSIONS

In conclusion, the results of this documentary research confirm that medical simulation, by integrating advanced technological resources and active pedagogical strategies, enhances clinical learning, strengthens professional competencies, and promotes safer and more efficient medical practice. The analyzed studies agree that clinical simulation not only optimizes the individual training of students but also transforms the institutional environments where it is applied by fostering a culture of patient safety and standardizing procedures (Issenberg et al., 2000; Gaba, 2004).

The documentary analysis reveals a growing trend towards the use of simulators with artificial intelligence, virtual reality, and machine learning, which allow for the adaptation of difficulty and feedback levels based on the user's progress (Sanchez et al., 2022; López & Rodríguez, 2023).

Montiel et al. (2024) propose that future research lines focus on evaluating translational outcomes, meaning how simulation directly impacts the improvement of real patient care and the efficiency of healthcare systems.

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Pulmonary embolism in a patient with chronic pulmonary disease: point-of-care ultrasound makes the difference

Tromboembolia pulmonar en paciente con enfermedad pulmonar crónica: UPA hace la diferencia

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Abstract

Pulmonary embolism (PE) and pulmonary hypertension (PH) are serious conditions frequently encountered in emergency settings. Early diagnosis and timely treatment are crucial to improve patient outcomes and survival. Acute right ventricular dysfunction, observed in echocardiographic findings, can aid in diagnosing PE and accelerate the acquisition of definitive imaging in unstable patients. A 52-year-old female patient with systemic sclerosis and pulmonary fibrosis, treated with mycophenolate, steroids, and sildenafil for pulmonary hypertension, presented with right pelvic limb edema. A Doppler study revealed femoral thrombosis, and anticoagulation was initiated. One week later, the patient developed progressive dyspnea, oxygen desaturation (SO₂ 68%), perioral cyanosis, and use of accessory muscles. Pulmonary ultrasound showed pleural effusion, pleural thickening, and characteristic echographic signs of PE, such as the "medusa sign" and "column sign." Laboratory results indicated elevated inflammatory markers and high D-dimer levels, suggesting thromboembolic events. Bedside echocardiography proved to be a key diagnostic tool, accelerating diagnosis and enabling early intervention.

Keywords: pulmonary embolism; pulmonary hypertension; bedside echocardiography; early diagnosis; emergency treatment

Resumen

La tromboembolia pulmonar (TEP) y la hipertensión pulmonar (HIP) son condiciones graves que se presentan con frecuencia en urgencias. El diagnóstico temprano y el tratamiento oportuno son fundamentales para mejorar los resultados y la supervivencia del paciente. La disfunción ventricular derecha aguda, observada en los hallazgos ecocardiográficos, puede ayudar al diagnóstico de TEP y acelerar la obtención de imágenes definitivas en pacientes inestables. Se presenta el caso de una paciente femenina de 52 años con esclerosis sistémica y fibrosis pulmonar, tratada con micofenolato, esteroides y sildenafil por hipertensión pulmonar. Consultó por edema en el miembro pélvico derecho, y un estudio Doppler reveló trombosis femoral, iniciándose anticoagulación. Una semana después, la paciente presentó disnea progresiva, desaturación de oxígeno (SO₂ 68%), cianosis peribucal y uso de musculatura accesoria. La ecografía pulmonar mostró efusión pleural, engrosamiento pleural y signos ecográficos característicos de TEP, como el "signo de la medusa" y el "signo de la columna". Los resultados de laboratorio indicaron marcadores inflamatorios elevados y dímero D alto, sugiriendo tromboembolia. La ecocardiografía a pie de cama demostró ser una herramienta diagnóstica clave, acelerando el diagnóstico y permitiendo una intervención temprana.

Palabras clave: tromboembolia pulmonar; hipertensión pulmonar; ecocardiografía a pie de cama; diagnóstico temprano; tratamiento de urgencias

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Pulmonary embolism in a patient with chronic pulmonary disease: point-of-care ultrasound makes the difference

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INTRODUCTION

Pulmonary embolism (PE) and pulmonary hypertension (PH) are potentially fatal diseases that present in the emergency department. Early diagnosis and timely treatment improve patient outcomes and survival. Echocardiographic findings of acute right ventricular dysfunction may indicate the diagnosis of PE and accelerate the acquisition of definitive imaging in unstable patients.

CASE REPORT

Patient: Female, 52 years old, with systemic sclerosis, pulmonary fibrosis, under treatment with mycophenolate, steroids, and sildenafil for pulmonary arterial hypertension with 7 months of evolution.



Figure 1. Right pleural effusion



Figure 2. Right pleural effusion, "D sign" in short axis.



Figure 3. Dilated right cavities, tricuspid insufficiency, and pulmonary artery dilation.



Figure 4. Apical view, 4 chambers, "McConnell's sign," paradoxical septal motion, and pericardial effusion are shown.

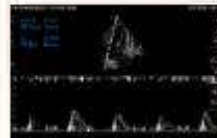


Figure 5 y 6. "60/60 sign"

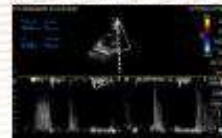


Figure 7. Right femoral venous thrombosis

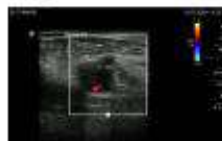
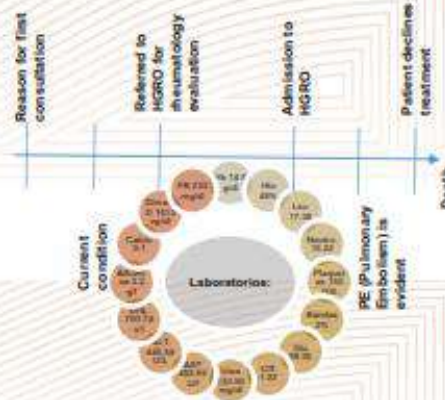


Figure 8. Left femoral venous thrombosis

Initial consultation reason: Right pelvic limb edema.

Doppler study: Femoral thrombosis, anticoagulation initiated.

Evolution: One week later, the patient presents with progressive dyspnea and desaturation, with SO_2 68%, perioral cyanosis, and the use of accessory muscles.



CONCLUSIONS

Bedside echocardiography represents a highly valuable diagnostic tool in clinical emergency practice. Performing point-of-care ultrasound (POCUS) shortened the time to diagnosis, respecting the patient's autonomy in deciding not to receive treatment. The clinical presentation and obtained images demonstrate that early intervention could have been implemented before performing any other imaging studies.

Pulmonary ultrasound:

- Pleural thickening and altered pleural sliding.
- Left pleural effusion.
- Characteristic ultrasound signs:
- Medusa sign and column sign → suggest parenchymal and pleural involvement associated with PE.

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