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Asociación Mexicana de Médicos en Formación A. C.

SOYAMMEF

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HEALTH & TECHNOLOGY

AMMEF
ASOCIACIÓN MEXICANA DE MÉDICOS
EN FORMACIÓN A.C.

Revista de la Asociación Mexicana de Médicos en Formación, A.C. (AMMEF, A.C.)

la AMMEF, A.C.

Es una asociación que reúne a más de 60 agrupaciones de estudiantes de medicina en México. Fundada en 1994, la AMMEF, A.C. antes IFMSA-México, es miembro de la Federación Internacional de Asociaciones de Estudiantes de Medicina (IFMSA), que representa a más de 1.3 millones de médicos en formación en 127 países a través de seis continentes.

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ABRIL OSOBAMPO
CHIEF EDITOR

Dear readers:

It is a great pleasure to bring you the 16th edition of the SoyAMMEF journal. The theme is selected thinking in the future of the medicine and I hope if of you enjoy with each of the articles that the future physians wrote.

I want to thank my amazing National Team partners for always being a support in each step in my work. To Aranza, my NOMP which help me and for being by my side in every decision. To my wonderful Editorial Committee (Lenyn, Charbel, Osvaldo, Fran, Bita, JPT, Jime, Luisa, Fer, Andser, Pamela, Mar, Mayte, Kayeyi, Sandy, Amy and Marifer) for trusting me, making my work easier, I just can be grateful of meeting you. Last but not less important, to my best friend and brother of Chief Editor, Von for trusting in me even when I does not trust in myself.

I hope you enjoy this articles and I say goodbye, telling you, reader I can not be here without you, and also to remember of always do science and express your opinion!

Abril Osobampo Corona
Chief editor SoyAMMEF 2024-2025

NOMP´s note

ARANZA ESCANDÓN

NATIONAL OFFICER ON
MEDICAL PUBLICATIONS

Dear readers,

As this is our second edition, we are deeply grateful to be able to share the stories and articles we have received from you. This time, with the theme of technology and science, we aim to raise awareness about their advantages and disadvantages in patient healthcare, a highly relevant topic in today's world.

SCOMP, as a multidisciplinary research committee, has witnessed how the use of new technologies has benefited the advancement of each of the projects we have developed throughout our management. All of this is always in your best interest, with the goal of providing you with the necessary tools to understand and leverage the positive impact of technology in each field of knowledge.

The magazine is not only a space to share information but also an opportunity for all of you, as active members of our community, to contribute your knowledge, research, and experiences. We would love for each edition to be a platform where we can all learn from one another, while also recognizing the efforts and dedication of those like you who are making a difference in your respective fields.

We hope that this content inspires you to continue exploring each page, but most importantly, that it encourages you to actively participate in future editions. The magazine is open to receiving your articles, essays, research, and reflections. Don't miss the chance to give visibility to your work and share your ideas with our entire community!

In our next edition, we look forward to your participation. You are the next ones to write it!

Aranza Escandón Wong
National Officer on Medical Publications
Term 2024-2025

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"ESCRIBIR PARA ACTUAR PUBLICAR PARA *CAMBIAR*"

SIXTEEN EDITION
MARCH 2025

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AMMEF A.C.

AMMEF
ASOCIACIÓN MEXICANA DE MÉDICOS
EN FORMACIÓN A.C.

The Senate of the Republic Enriched by the Presence of Medical Students Representing AMMEF

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On November 13, 2024, medical students from various parts of Mexico gathered at the Senate of the Republic to commemorate World COPD Day. The occasion featured the forum titled "Chronic Obstructive Pulmonary Disease and Cystic Fibrosis: Priority Public Health Issues."

The event began at 1 p.m. As attendees made their way to the venue, prominent representatives from across the country could be seen in meetings or engaged in discussions in the common areas. Upon entering the forum, various participants began arriving, including the recording team, as the event was set to be broadcast on television and YouTube. Shortly afterward, the experts in the featured topics arrived and took their places at the presidium.

The forum commenced with presentations from COPD experts. They emphasized the critical need for continuous training of general practitioners, especially those in remote areas where early diagnosis and treatment can mean the difference between life and death. The speakers also highlighted the importance of investing in hospital resources for acute episodes, pulmonary therapies, and medications for chronic stages. Following their presentations, there was an opportunity for public participation and a Q&A session.

The event's official inauguration was then conducted by the president of the health delegation, alongside various senators and presidents of prominent organizations such as Salud Justa. They addressed several proposals aimed at reducing the rising incidence of cases and supporting public health programs.

Afterward, a recess allowed attendees to enjoy refreshments and exchange ideas, projects, and contact information. This interaction included medical students (active members), AMMEF executives, and local and national representatives present at the forum.

The forum concluded with discussions on cystic fibrosis. Experts from leading hospitals in Mexico City shared insights into the current challenges in diagnosing and treating this condition, stressing the importance of raising awareness about the disease. This was followed by another round of questions and answers.

At the end of the event, participants had the chance to engage in various activities. These included carrying backpacks or weighted vests to simulate the experiences of individuals living with these conditions, taking commemorative photos with themed frames for COPD Day, speaking with experts on the topics discussed, and capturing a group photo of the delegation in front of the Senate's emblems, along with individual photos as keepsakes of the brief but enriching visit to the Senate of the Republic.

After leaving the forum, we took an unofficial moment to socialize among the attendees, which provided an opportunity to reconnect with friends and work teams.

Without a doubt, this was one of the most rewarding experiences I've had through AMMEF, and I highly recommend participating in future editions or other events offered to us.

Warm regards,
Usmar Franco
Medical Publications Assistant, SCOMP

SCOME

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Health and Technology: Artificial Intelligence and Digital Educational Instruments impact on Medical Education.

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Throughout history, technology's employment in Medicine has turned into a key pillar for clinical procedures along with medical education. In previous years, Artificial Intelligence (AI), in conjunction with digital resources like Anki and Kahoot, has reshaped how medical students access information and engage in the learning process. This article will address how medical training is being impacted by technology focusing on AI, Anki, and Kahoot.

The Role of Artificial Intelligence (AI) in Medicine

Medicine is no exception to AI's revolution. This technology has been implemented to enhance study methods through summaries and diverse resources, resulting in an effective and interactive learning experience. According to a study by Jiang et al., AI plays a key role in education, particularly in clinical simulations and medical data analysis, allowing students to practice in safe, controlled environments. (1)

As previously mentioned, one of the AI tools is its ability to generate practice exams tailored to the student's abilities, providing instant feedback on their strengths and weaknesses, and helping them enhance their knowledge. This kind of resource is valuable for students since it allows them to be self-taught and make the most of time.

In addition, AI is being applied in other areas such as diagnosis and imaging, among others. Techniques like image recognition and genomic data analysis are transforming how doctors identify diseases. Castro et al. suggest that AI demonstrates high performance in interpreting magnetic resonance images and CT scans, enabling more accurate and faster diagnoses. This advancement not only enhances the quality of diagnoses but also allows medical students to familiarize themselves with radiological images, with AI supporting them and continuously reviewing their learning process. (2)

Digital educational instruments: Anki and Kahoot

Besides AI, platforms such as Anki and Kahoot have become relevant among medical students due to their interactiveness and accessibility.

Anki is a platform that employs a Spaced Repetition System (SRS), enabling concept review through strategically timed intervals that enhance long-term memory retention. Ayala et al. suggest that spaced repetition, using tools like Anki, has proven to be one of the most effective techniques for learning and retaining information among medical students. This method is particularly useful in fields that require memorization of large

volumes of information, such as anatomy, pharmacology, and disease diagnosis. The authors' pilot study demonstrated that Anki significantly contributes to long-term memory retention throughout medical training.(3)

On the other hand, Kahoot is a game-based learning platform that enables students to engage in interactive and competitive quizzes. This tool has proven to boost engagement, commitment, and motivation due to its dynamic and entertaining evaluation mechanism. According to Fernandez et al., the use of Kahoot in Pathologic Anatomy showed that it effectively measures the level of retained knowledge among students, enhancing their learning process. The study demonstrated that this platform is a valuable tool for reinforcing key concepts while keeping students motivated and involved in their studies. In medical education, Kahoot can be utilized to create practice exams in a fun and competitive format, increasing interest and helping students assess their prior knowledge before taking actual exams. (4)

AI's impact on Global Health and new study formats based on digital education instruments

The integration of technological tools in medical education enhances access to high-quality educational resources, which is particularly valuable in underdeveloped countries with limited educational opportunities. These accessible, often free tools, promote a more equitable medical education by reducing barriers such as geography and financial circumstances.

Additionally, the use of digital tools in medical education facilitates the creation of global learning networks where professionals and students can share resources, research, and experiences. This collaboration not only enhances the quality of education but also creates international engagement to address global health challenges.

Ethical considerations and challenges

While technology has advanced rapidly in medical education, it has also introduced ethical considerations and challenges. One fundamental concern is the risk of technology diminishing human interaction. Empathy, clinical judgment, and patient communication are essential skills that cannot be easily replicated by a machine.

Furthermore, students may engage in passive memorization or misuse simulation tools, which can reduce their ability to demonstrate critical and reflective thinking in real-life situations. While these tools are valuable resources, they should complement active learning and direct patient interaction rather than replace them.

Finally, the use of AI in medical diagnosis raises concerns about privacy and data security. Managing vast volumes of information necessitates urgent measures to prevent misuse. It is essential for digital policies to prioritize the protection of patient information.

Conclusion

Technology, particularly AI and digital platforms like Anki and Kahoot, is transforming medical education by enhancing accessibility, efficiency, and diversity. These tools enable medical students to deepen their learning, improve diagnostic accuracy, and engage in simulations to strengthen their knowledge. However, their implementation must be balanced, preserving the critical role of human participation in medical practice and ensuring the protection of patient data. When guided by ethical principles, technology has the potential to not only advance medical education but also improve global health as a whole.

Artificial intelligence and digital tools are transforming medical education, faciliting student learning through simulations and interactive resources

Medical Education, the Life of a Medical Student, and the Environment That Shapes Them into Physicians

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Medical students are characterized by their complexity, with their mindset standing out as a significant strength. This mindset is built upon various elements, such as values, awareness, ethics, motivations, desires, personality, and more. Moreover, medical students are resilient and focused on specific activities, but they can also be distracted or unaware of their surroundings. These distractions often stem from the educational model implemented by universities themselves.

Human beings naturally develop, form mentalities, and build relationships based on biopsychosocial factors that impact this growth positively or negatively. From the very beginning of medical training, students learn to immerse themselves in books—a habit that is immensely beneficial academically. However, and to the frustration of many, life as a medical student is not all about studying. From this writer's perspective, being locked in a room eating and drinking next to a pile of books, attending classes, and completing assignments like a robot is not the essence of medical training.

It is crucial for physicians-in-training to be educated not only as individuals within the realm of medicine but also to be encouraged to embrace and promote the social role they will one day fulfill.

This involves addressing and recognizing the needs of the population, improving public health and well-being, creating public policies, advocating for preventive measures, and striving to improve the living conditions of their patients.

At this point, I pose the question: What is the value of a physician who is academically outstanding but cannot establish a doctor-patient relationship or who forgets their social role?

Some might argue, "There are areas of medicine where the doctor-patient relationship isn't as relevant (depending on the specialty)." However, human nature, since prehistoric times, shows that humans are communal beings, sensitive to others' emotions, and guided by reasoning. Therefore, a physician lacking social intelligence and awareness will face deficiencies in ethical, psychological, and social aspects. Among these, the most critical issue is the difficulty in building relationships with patients.

It is essential to emphasize that the central axis of medicine is not the physician but the patient—or, more broadly, the population. How does failing to establish a healthy doctor-patient relationship affect us? At best, it could lead to the physician losing a patient.

However, more concerning is the possibility of eroding trust in the physician, which may result in poor adherence to treatment. This can have implications beyond the individual, impacting public health. Such events are rarely isolated, as statistical trends suggest that this issue may reflect systemic shortcomings in medical education models heavily focused on clinical and surgical knowledge, with little attention to social and interpersonal skills.

What can be done?

Medical education must evolve. A medical student should not be guided through their career with outdated methodologies. In changing times, we need a different approach to education. Training future healthcare professionals must be multidisciplinary, not solely centered on clinical and surgical knowledge. It should encompass aspects of the humanities, law, culture, and social sciences.

However, more concerning is the possibility
We can address this transformation even as students, by becoming leaders in policymaking within our institutions or by participating in decision-making groups, such as advisory boards. Students represent the face of their universities. This title carries weight, and it is essential to honor it. The truth is, there are no "bad schools," only students who fail to demand better, who don't study, and who don't work together as a community for a common good.

Key Takeaways:

"It's meaningless to be a top-performing doctor if you forget your role in society."
"It's meaningless to be a doctor if you don't know how to connect with the person in front of you."

We are ——————

—————— SCOMPanions

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Surviving a Scientific Poster Competition: My First Success as Event Organizer and Participant

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"Gratitude is the memory of the heart."

As I reflect on the 2nd Local Scientific Poster Competition, I recall the many uncertainties I faced when planning began. When I started my role as Local Officer for Medical Publications (LOMP), the only scheduled activity was the Poster Competition. This was to be its second edition, held during the Regional Medicine Congress in Ciudad Obregón, Sonora, in October, organized by the Medical Student Society (SEM).

I began with significant doubts about how to manage the logistics, as I had never participated in a poster competition or completed a systematic review. My fear stemmed from my lack of knowledge at the time. Over time, I dedicated myself to learning about systematic reviews, creating a brief guide, and gradually asking how to carry out the activity. Here, I must express my gratitude to Abril Osobampo, a former LOMP, who organized the first edition of this competition.

Whenever I had questions, she would resolve them, providing a "how-to" guide for running the competition, suggesting ideas, advising me on whom to approach for securing judges, and offering assistance on the day of the event.

To prepare participants, in August we hosted the lecture "The Importance of Systematic Reviews," delivered by Abril Osobampo. Later, the call for submissions was published. In October, Rodrigo Quintana, Capacity Building Coordinator for the national SCOMP, conducted the training "The Winning Poster." These activities were instrumental for participants, as they covered key points for competing in the event.

During the preparation period, I worked closely with Maryelba Soto, SEM president and an active SCOMP member. I am deeply grateful to her for granting us a space within the Congress. I never imagined how much effort is involved in student society activities. It was a valuable learning experience to organize calls for submissions, manage official letters, and draft certificates. For this, I am especially thankful to María Inés Flores, SEGE at SOCEM UNISON, who offered suggestions and helped with the administrative paperwork.

The theme of the Congress was "Transcribing the X Chromosome," focusing on prevalent diseases in women.Consequently, the systematic reviews aligned with this theme, and the jury was composed of female researchers. I extend my gratitude to Dr. Jael Teresa de Jesús Quintero Vargas, Lic. Sandra Miranda Mauricio, and Dr. Rocío Milagro López López for their participation, insights, and contributions to the event.

What I enjoyed most during the process was the communication I had with participants. Many were not part of SCOMP, yet they demonstrated remarkable interest and dedication in preparing their submissions. I also appreciated the opportunity to get to know SCOMP members better, discussing their systematic reviews and their ideas for the society. Reading each article, providing feedback, and watching the posters evolve from design to final print was incredibly rewarding.

On the day of the competition, I was nervous. Everything felt like it was moving too quickly, which at times overwhelmed me. I am immensely grateful to Josué Portillo, Abril Osobampo, and Lizbeth García, who supported me throughout the event. While I cannot fully imagine the individual experiences of the participants, I was delighted to hear members of the committee describe this as their favorite activity.

A total of eight posters were presented. The winning entry was titled "Systematic Review of Tubal Ectopic Pregnancy: Evaluation of Salpingostomy and Salpingectomy in Fertility Preservation and Recurrence Prevention." It was dedicated to Helen Adriana Rodriguez Espinoza, a medical student from Campus Cajeme who tragically passed away at the age of 24 due to medical negligence.

On April 9, 2024, Helen sought care at the General Hospital in Ciudad Obregón with an initial diagnosis of "acute abdominal pain with possible ruptured ectopic pregnancy." She was denied medical attention due to her social security coverage and sought help at the Ciudad Obregón IMSS hospital, where she was classified as a "yellow code" and refused care. Helen suffered four cardiac arrests, the last of which caused her death. She passed away just days before she was to receive her medical degree (1).

Raising awareness in society is vital for the progression of our community. Activities like this competition serve to honor injustices, reminding us of the challenges that persist. The winning poster addressed a topic that deeply affected our university community, and presenting this information with respect and clarity is profoundly meaningful.

While there is room for improvement, this activity allowed me to grow professionally and become part of something greater within my university community, which was deeply gratifying. I am incredibly grateful for this experience.
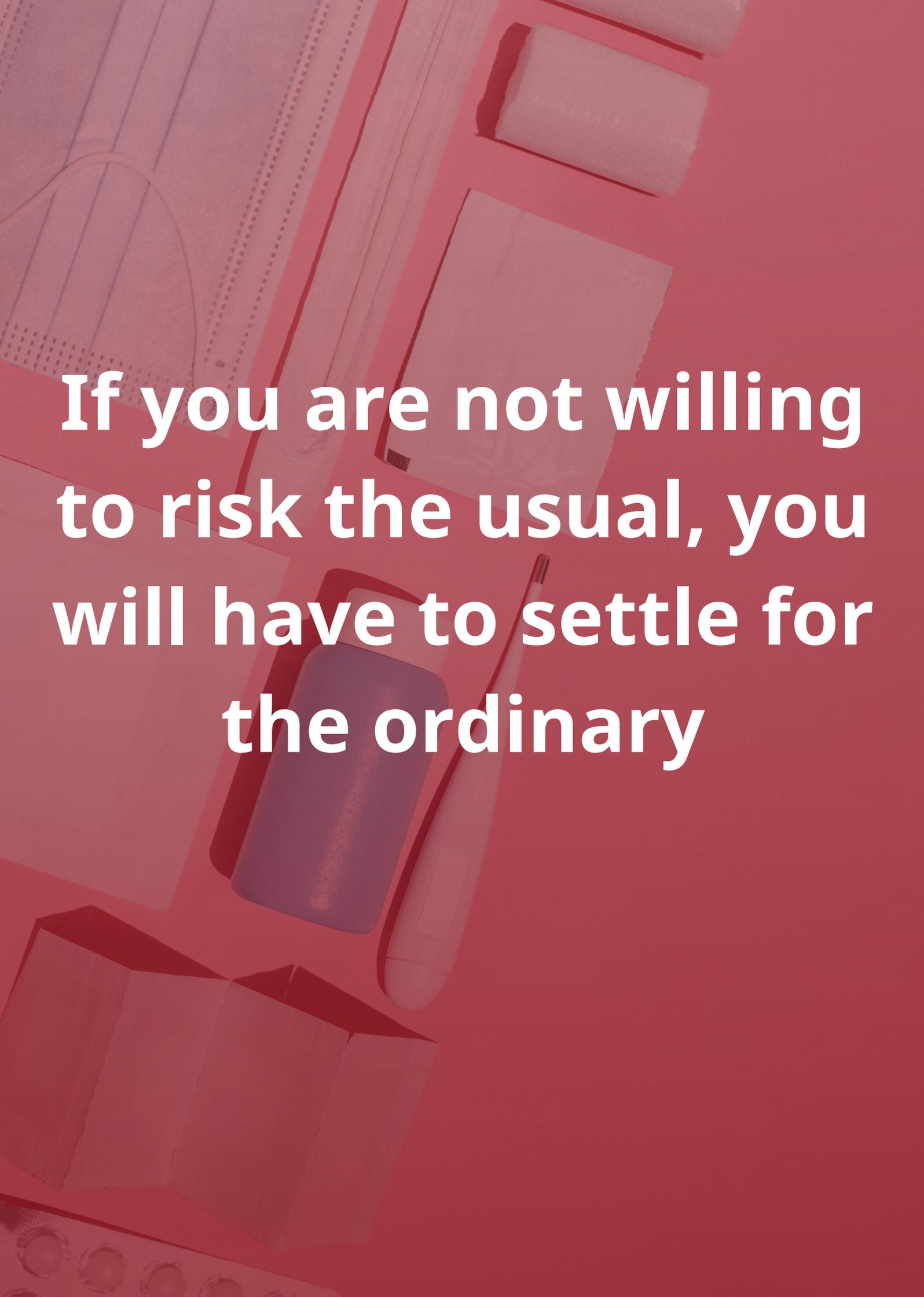
If you are not willing to risk the usual, you will have to settle for the ordinary

Overcoming the Impossible: My Journey of Resilience, Faith, Opportunities, and Accomplished Dreams

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I had never faced challenging moments until I had a car accident on my way to school on November 21st, 2023. This accident resulted in whiplash syndrome that felt endless. The whiplash caused significant issues in my life, including vertigo, constant headaches, hyperreflexia, paresthesias, and tinnitus, primarily affecting the left side of my body due to problems with the C5 and C6 vertebrae, where cervical kyphosis and a herniated spinal disc were discovered. At one point, I even considered delaying my tests because the doctors believed my condition would require surgery with a permanent cervical plate. Amidst my medical treatment and personal struggles that affected my quality of life, I felt as if anxiety and depression were overwhelming me, causing my plans to seem even further away.

Despite this, I have always considered myself a person of faith, and my experiences have fostered resilience within me. I continually seek opportunities for personal, spiritual, and professional growth to become exceptional. With this mindset, I fought to continue my studies despite the pain and my impaired mental and physical health because I had a clear goal: to become a physician worthy of treating patients and, ultimately, a great pediatric oncologist.

One day, as I was walking out of class, I noticed an activity organized by the "Asociación Mexicana de Médicos en Formación" (AMMEF), which featured a "Be The Match" event that helps people with hematological conditions, including leukemia. Without hesitation, I offered to volunteer. It felt like a dream come true! I have always wanted to assist in organizations that support this cause. One week later, I attended the Committee's Fair, where we discussed various opportunities for growth and development. My goal was clear: research.

Since starting college, I envisioned engaging in research, as I believe it's essential for progress in evidence-based medicine. However, being young and inexperienced, I felt there was little chance of publishing research as an undergraduate. Nevertheless, I shared my plans with the person in charge of the Standing Committee on Medical Publications (SCOMP), and to my delight, he welcomed me with open arms.

I then had the chance to participate in the fourth edition of "Innovation, Research and Advocacy," representing my local committee, CAEM UAEH. Participation was typically limited to the Local Officers of Medical Publications, so being allowed to take part as a new active member felt like a privilege.

I remember responding with a resounding "YES!" and a sparkle in my eyes – finally, I had a chance! Although fear of my lack of experience in research lingered, my hunger for growth and achievement pushed me forward.

I immersed myself in every video of the "Course on Drafting and Elaboration of Investigation Protocols" (CREPI), striving to give my best effort. Thankfully, I had an exceptional team by my side, filled with friends who supported me despite my limited experience. I learned so much from them, and they gave me the confidence I needed. We still collaborate on various projects to this day, and they were the first friends I made through AMMEF. Our investigation protocol ultimately earned us third place in the edition.

My desire for growth was just beginning when another opportunity arose: to become a Local Officer on Medical Publications (LOMP). At first, it seemed like a far-fetched idea that I could be elected to such a competitive local committee, but I tried anyway and was elected!

Later, I received another opportunity to be a delegate at the XVI National Assembly of AMMEF in Chihuahua, Mexico. Upon learning about the benefits, I didn't hesitate. I spoke to my parents, who are my most loyal supporters and purchased my ticket.

This was my first National Assembly, and I participated in everything I could: the XX National Competition of Scientific Research Posters, where I presented my clinical case and transformed my tragedy into a scientific poster. While I didn't win, I appreciated the courage I found within myself, despite lacking experience, as it helped inspire many students who approached me. I felt my purpose was fulfilled. I was also part of the Research and Epidemiology Team during the Assembly. I made sure to attend every social event, which was a challenge since I was not accustomed to staying out late and ended up sleeping very few hours to prepare for the next day. A humorous moment occurred during an activity held by SCOMP in collaboration with SCORE, where we were assigned the quirky topic of "The cows' aerodynamics" for a Scientific Poster Workshop, yet we still managed to win.

The AMMEF, ChihuhuAN, and SCOMP became my chosen family and changed my life for the better. They reignited my dreams and helped me accomplish goals I once thought were impossible. In just six months, I have participated in extensive research and formed friendships with students from various states in Mexico and different academic years. Some Local Officers and I continue to meet for inter-committee activities, forming a team dubbed "LOMPsitos Team." We created a webpage to showcase all of our activities, and we have become great friends. My Active Members and my Local Team provide unwavering support.

When I initially received the Standing Committee on Medical Publications, there were no activities planned, but that quickly changed. We now have over 90 Active Members dedicated to research. We have submitted articles to various journals, including indexed ones! I organized the First Local Competition of Scientific Research Posters at my university, featuring high-prestige researchers, including a national researcher recognized in the third degree of the National System of Researchers (SNI). The winners in each category were given the opportunity to publish in an indexed journal. Faculty, students, and even the families of participants attended the event, providing motivation and support.
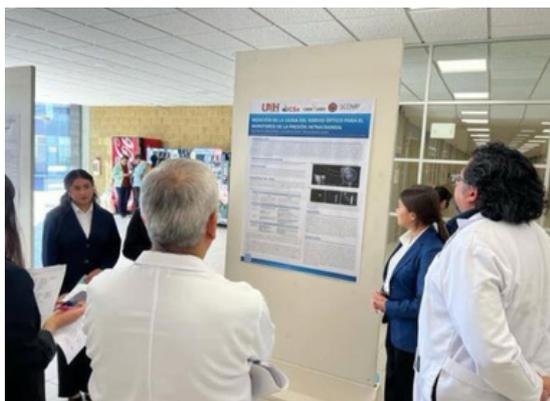
Nothing makes me prouder or happier than helping fellow students who share my goal of finding opportunities for medical students to grow and develop. In the end, surgery was not required, and I achieved far more than I had ever dreamed; I gained more than I lost. Every tear shed was met with laughter, and every frustration turned into triumph and desire. I realize I have often used the word "opportunity," but that encapsulates life—endeavoring to overcome fear and challenges, even when something seems impossible. What would have happened if I had given up at that moment?

As a quote suggests, "In order to attain the impossible, one must attempt the absurd," which may be attributed to either the Spanish writer Miguel de Cervantes Saavedra or South African former president Nelson Mandela, who said, "It always seems impossible until it's done."

Lastly, I would like to leave you with this phrase of my creation: "May the pursuit of research transform us into the physicians worthy of treating our patients." - Hannia Andrea Vera Rodriguez

The only thing that is impossible is what you do not try

We are

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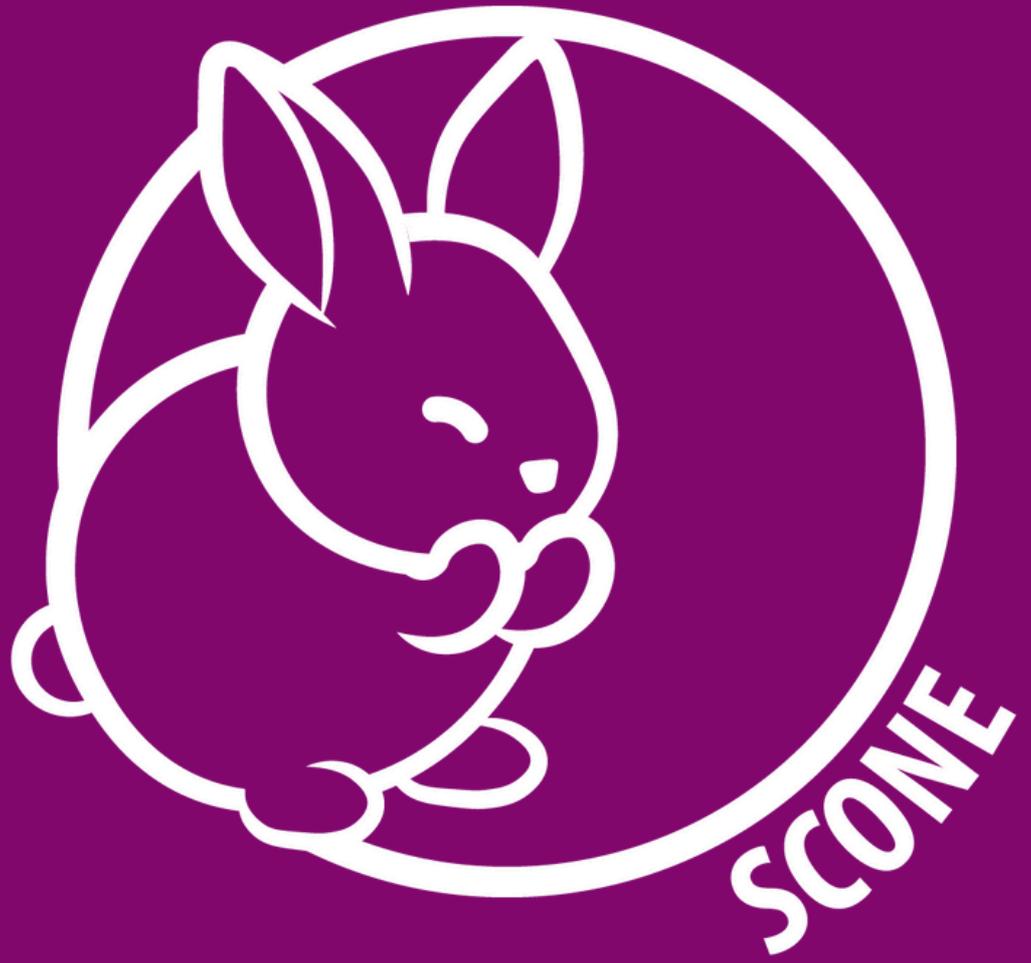
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"Help me to Hear" an opportunity for learning

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Every experience in life shapes our understanding of our environment through our senses, which highlights the importance of relying on them. I reflected on this when Dr. Daniel Bernal offered me the opportunity to participate in the humanitarian health campaign "Help Me to Hear," organized by the Mesa Baseline Rotary Club along with other institutions, including the University of Arizona. This campaign has been held annually since 1992. Our role was to conduct audiology triage tests, as the main objective of the health campaign was to provide hearing screenings, audiological diagnostic testing, Ear-Nose-Throat medical examinations, and hearing aid fittings.

Upon arriving in Guaymas, Sonora, my colleagues Yudith Preciado, Dr. Bernal, Vianey Bourne, and I headed to the school where the campaign was taking place. We immediately faced two significant challenges: the language barrier—I was the only one who spoke English fluently—and the general organization. The volunteers from Mesa, Arizona, and other countries were eager to help, but most primarily spoke English.

We began preparing for a long campaign by organizing the audiology diagnostic instruments and otoscopy equipment. The children were the first to receive our attention, but it was hard to keep them in one place for the triage process. The parents were patient and made a concerted effort to assist us, and gradually, we found our rhythm for efficient work. We were fortunate to receive guidance from two outstanding individuals, Robert Jensen—whom I affectionately referred to as My bestie Bob—and Erica Williams. By the end of the day, we felt almost like experts in performing triage.

The next morning, we began receiving adults for the same tests. This time, the work was easier, and we had the opportunity to learn more about the different machines used for triage. As the first line in the process, we assisted in making molds for hearing aids. I was responsible for communicating with patients and guiding them to the programming area while also acting as a translator for the technicians and doctors. The patients were incredibly kind and grateful, and I felt fortunate to contribute to achieving our goal.

One of the highlights of this wonderful experience, aside from learning and applying audiology, was the positivity of the patients, families, and all the teams we worked with over the two days. I especially appreciated meeting Bob, one of the founders and an audiologist who inspired me to strive for more. He said, "We need to give back a little to society," embodying a passion for assisting patients and sharing what he loves the most.

By the end of the campaign, we had reached approximately 300 people—a number that continues growing each year—as the Rotary Club remains committed to improving hearing conditions for hundreds of individuals in Sonora.

After nearly 14 hours of work that day, we gathered at a restaurant by the seashore in San Carlos, where we shared a meal as a family, free of language barriers. This experience holds a special place in my heart, and I hope to have the opportunity to assist in the next campaign and be part of that wonderful team. As my bestie, Bob Jensen said, "We need to give back a little to society."

We are

SCOPEans

SCOPE
INTERCAMBIOS PROFESIONALES

Cartagena: where Science and History encounter.

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Being part of the XXIX Summer of Scientific and Technological Research of the Pacific marked a milestone in my academic and professional development. During this experience, I had the opportunity to participate in an academic exchange in Cartagena de Indias, Colombia, where I presented my research on tuberculosis. This city, with its colonial atmosphere and vibrant culture, became the ideal scenario to spread knowledge, explore new perspectives, and strengthen my inner compromise with science. Led by the accessibility and professionalism of Jaime, the project leader, I submerged myself in the fascinating scientific investigation field. His disposition to sharing experiences and meticulous perspective taught us not only the steps to investigate but also integrated the passion within it. This participation highlighted profoundly my tuberculosis understanding and the significance of scientific investigation.

Arriving in Cartagena was an accomplishment that marked my journey. I had been selected to represent my university, which involved not only months of hard work but also the responsibility of discussing and contributing to a global issue. My scientific article presented new perspectives on early diagnosis and prevention strategies for tuberculosis, a disease that remains vital and urgent. Tuberculosis has accompanied humanity since ancient times; nevertheless, in many regions of the world, it continues to be a complex challenge.

Throughout my investigation, I submerged myself in the social and economic impact (especially on vulnerable populations) of tuberculosis. Cartagena with its history of resilience and overcoming turned out to be the ideal place to deliver these findings, since its narrative reflects the perception of confronting adversity wisely.

In the main auditorium, surrounded by brilliant minds and passionate hearts, I presented the findings of my research. The nervous anticipation I felt as I took the stage quickly dissolved when I saw the attendees' genuine interest. Each question, and each comment, reminded me of why I love medicine: because it has the power to connect people in a collective effort to improve lives. A highlighting moment of my experience in Cartagena was when I had the opportunity to enter an operating room at a local hospital. There, I participated in a biopsy of a tuberculosis patient, who was a homeless person from the city's main streets. This encounter deeply amazed me, not only because of the clinical aspect of the procedure but also due to the social reality surrounding it.

It was an impactful reminder of the multiple layers of vulnerability faced by those suffering from this disease, and it reinforced my commitment to working toward holistic health solutions. These interactions were a reminder that science knows no borders and that every contribution, no matter how small it may seem, can make a difference.

Cartagena provided me with more than academic knowledge, in its cobblestone streets I encountered stories of resilience that resonated with my own experience. On a particular afternoon, walking through Getsemaní, a mural stood in front of me with "future is built with footprints of the past" written on it. That phrase echoed my entire trip, constantly reminding me that every step in the medical investigation is built with the effort of who precedes us.

My exchange experience also allowed me to build connections with students and professionals who shared my concerns. From passionate debates on health innovation to exploring local gastronomy, every interaction expanded my perspectives and demonstrated the importance of international collaboration. It was through more casual exchanges that ideas emerged, which I hope will eventually materialize into shared projects focused on addressing global health challenges. One particularly memorable experience was when I visited a local hospital and witnessed how health challenges are confronted within a health system different from my own. The dedication of the medical staff, despite limitations, was truly inspiring and led me to reflect on how much we can learn from one another.

At the end of my exchange, watching the sunset over the bay, I realized that Cartagena had given me more than just knowledge. It taught me that research is not just about numbers and data, but about human stories; that individual effort finds meaning when it becomes part of a collective purpose; and that the medical path, although challenging, is filled with rewards for those with passion and commitment. Back home, I'm leaving with not only a scientific article but also a vivid passion to keep contributing to the medical field and a deep gratitude for having been part of an experience that transcended every boundary that ever existed in my mind.

Cartagena de Indias stayed carved on my heart. Where science and history were encountered to reveal a new perspective on the meaning of being a doctor and citizen of the world. The exchange was not only a personal success but also an affirmation that medical investigation can transform lives.

I hope that my experience inspires students to seek similar opportunities and to remember that, although challenges may be significant, the impact we can achieve as a global community is infinitely greater.

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Fulfilling My Dream in SCOPH

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It is a great pleasure to address you once again, and I want to thank the editorial team of the magazine "SoyAMMEF" for this wonderful invitation. Let me introduce myself: my name is Juan Vazquez, though most people know me as "Vazquez," while my beloved SCOPHians refer to me as "Papa Bear." I currently serve as the National Public Health Officer (NPO) for the 2024-2025 term.

Through this medium, I'd like to share my experience in this remarkable role. To be completely honest, if I were to compare the version of myself on election day to who I am now, I can confidently say we are two completely different people. The perception of a Standing Committee changes significantly depending on the level at which one works within SCOPH, encompassing roles such as active member, local officer, national team member, and national officer—all of which I am proud and committed to have held.

Being an NPO is undoubtedly not what I initially expected—not in a negative sense, but because of the great surprises that awaited me when I took the reins of this beautiful committee. I firmly believe that we are remembered for the actions we take and the influence we have on others, whether positively or negatively.

The mere realization that my decisions significantly impacted my local counterparts was a pivotal moment for me. Truthfully, the start of my term was anything but easy. Organizing, planning, and implementing all public health-related activities on a national scale was an incredibly challenging task. I remember that on the very first day of my term, barely 24 hours into the role, I already had a major responsibility on my shoulders: managing a collaboration agreement with an external partner working alongside SCOPH. I faced tight deadlines and processes that were completely new to me and that I knew nothing about. However, as the saying goes, after the storm comes the calm.

This term has been a journey of ups and downs, especially as we balance academic and extracurricular obligations. None of this would have been possible without the incredible support of my National Team (NT).

Reflecting on my NT, I vividly recall the day of the applications, filled with questions in my mind: What if very few people apply? What if I choose the wrong people? What if no one applies at all? What if I don't fill the positions and have to go through multiple rounds? It's a feeling I wouldn't wish on anyone. Today, I can confidently say that I made great choices —not just in forming a team, but in building a family for this term.

It's fascinating to see how everyone on the national team is so different yet so similar, united in their drive to elevate public health in Mexico. They consistently go above and beyond to achieve the greatest good for their local counterparts. They are so skilled that I often thought, if by some twist of fate I had to step down, SCOPH would be left in excellent hands.

Let me start with Luis David, or as we know him, "LuisDa," my left hand in the NT. He is highly skilled in every aspect of SCOPH, always seeing opportunities for growth rather than problems, and is willing to take on any task entrusted to him.

Next is Alan, affectionately called "Jalan," my right hand and my support even before the elections. He has been a pillar in navigating various challenges we've faced, though sometimes he vanishes, and we jokingly assume the worst!

Alfonso and Bryan, self-nicknamed "Tonto" and "Retonto," are the best Member Coordinators I could have chosen. Their dedication to Local Public Health Officers (LPOs) and their ability to foster a sense of belonging within SCOPH are unparalleled. Together, they make an extraordinary duo, with every day bringing a new adventure.

Angie and Carlos—though "Angie" is short for Angelica, no one, literally no one, calls her by her full name—are the training experts of AMMEF. Their innovative ideas and personalized LPO training sessions are invaluable. If you get the chance to meet them, you'll notice how different they are: one is endlessly talkative, while the other is as serious as a tomb. Yet, it's precisely these contrasts that make them shine in their area.

The "Armandos," or as I call them, Armando Marketing (Armando 1) and Armando Exchanges (Armando 2), each play distinct roles within the NT despite sharing a name. Armando Luna consistently impresses me with his creativity and innovation in designs and marketing, leaving many speechless with his work. On the other hand, Armando Uranga is the go-to person for exchanges. His proactive approach has positioned AMMEF among the top IFMSA-affiliated countries with the highest number of public health exchange spots, all without much fanfare.

Then there's Leda—affectionately called "Lida"—one of the most dedicated individuals I've ever met. Her work ethic and operational skills are unparalleled, and sometimes I wonder if she's a machine. She's resolute, confident, and a true leader.

Aida, "The Influencer" of the NT, radiates positivity and is incredibly approachable, making it easy to be yourself around her. She always finds a way to make you smile, and when it comes to epidemiology, she's a force to be reckoned with.

Lastly, Ivanna, "La Regia," is someone I'm immensely proud of. I had the privilege of mentoring her last term, and it's clear she knows exactly where she wants to go. Her expertise in SCOPH protocols and her commitment to every activity and session reflect the exceptional person she is, always giving her best.

I'm incredibly happy and grateful to have these people by my side, both in SCOPH matters and beyond. They've proven to be highly capable in every challenge I've thrown their way. This message is dedicated to thanking them for everything they've done for me during this nearly year-long term. In them, I found a family that, while I can't see often, is always just a message away. I wish them nothing but success and am confident they're on the right path to achieving great things in life.

To my dear SCOPHians, meeting you, whether in person or virtually, has reaffirmed my commitment to you. Unfortunately, my time in this position is coming to an end; not everything lasts forever. But holding this role and doing my best has always been for you. Seeing your dedication to your local committees and going above and beyond fills me with joy. If my work has ever inspired or motivated you, then all my efforts have been entirely worth it.

Thank you for trusting me. I hope I've met your expectations.

I bid you farewell, wishing you all the best of success and, most importantly, thank you for taking the time to read about my experience. For those who know me, you know I always try to approach everything with humor and an unconventional perspective. Signing off from "The Capital of the World," this is "Un Mushasho Shulo de Chihuahua" who, according to some, happens to be your NPO.

Be yourself, the other positions are already filled

DENTISTRY AND DISABILITY: A REALITY WE ALL NEED TO ACKNOWLEDGE

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Equitable access to healthcare is a fundamental right, and the field of stomatology should be no exception. Nevertheless, however, in daily practice, it is evident that many people with disabilities face barriers that restrict their access to oral healthcare. This situation compromises not only human dignity but also their overall health, as oral health is not merely an aesthetic matter but a fundamental pillar of general health. For this reason, interdisciplinary teams and well-trained professionals are essential to address the diverse needs of stomatological care.

The importance of oral health in people with disabilities as a fundamental pillar of integral well-being

Oral conditions such as periodontal diseases, untreated cavities, or dental infections can, beyond causing pain, affect other organs and systems, leading to cardiovascular diseases, malnutrition, or even sepsis. For people with disabilities, these conditions can exacerbate existing health issues, further reducing their quality of life and life expectancy. Additionally, poor oral health can hinder social inclusion and full personal development. Accessible, specialized, and empathetic stomatological care provided by well-trained professionals to address the needs of individuals with disabilities would serve as a key pillar in promoting holistic well-being for this vulnerable population.

Challenges of the disabled population

People with disabilities often face significant limitations or lack the motor skills needed to maintain proper oral hygiene. Some disabilities can impact the correct development of the orofacial region and dental eruption, deteriorating oral functions and reducing their quality of life. Additionally, the use of certain medications can lead to xerostomia or imbalances in the oral microbiota, exposing them to a higher number of risk factors.

The stigmatization of this population, coupled with the hesitation of oral health professionals who may feel unprepared to care for patients with specific needs, creates significant challenges for those seeking the timely, appropriate, and respectful care they deserve. Furthermore, financial barriers faced by many Mexican families, often resulting from insufficient or poorly distributed government programs, further exacerbate the issue. It is therefore essential to ensure inclusive access to care and work to reduce barriers for a population that already faces numerous obstacles in their daily lives.

Patient's family role in oral health care

The relationship between individuals with disabilities and their families should not be underestimated, as their daily care, along with the collaboration of dentists, is undoubtedly a significant step toward improving their quality of life. However, some families or caregivers may not recognize the importance of oral health for this group, which often delays or prevents them from receiving appropriate care.

Nonetheless, the daily involvement of caregivers is crucial in these cases, as maintaining oral hygiene for this group is often not an easy task and can be more complex. It is also essential that caregivers receive proper guidance from professionals on how to improve the oral health of the patient's well-being.

Towards holistic stomatological care

Transforming the reality we know today requires concrete, innovative, and coordinated actions, alongside education. A specialized education that incorporates diverse approaches for treating patients with disabilities, alternative therapies, and the promotion of sign language to enhance communication and foster empathy with our patients. Additionally, implementing accessible campaigns for caregivers and family members, and adapting information to diverse needs, is essential, as preventive medicine helps reduce the necessity for future invasive interventions.

Besides these strategies, it is essential to have interdisciplinary collaboration with other healthcare professionals to provide holistic care and deliver timely, personalized treatment based on each patient's needs. This approach helps overcome barriers and fosters a positive experience in oral health, as many individuals are often discouraged by hearing negative experiences or receiving inadequate care from professionals. In addition, it is imperative that disabled patients feel comfortable, about proper access like ramps, wide doors, and inclusive areas for limited mobility/wheelchairs. These strategies can guarantee effective and dignified oral health, with a mission of improving significantly disabled patients's quality of life.

Conclusion

Taking care of oral health is not just an aesthetic concern but a fundamental pillar of overall health, particularly for disabled patients. Ignoring it compromises not only physical function and well-being but also self-esteem and social inclusion within this vulnerable population. Ensuring accessible, adequate care for people with disabilities promotes equity and dignified health, enabling them to smile without barriers. Every preventive intervention and empathetic treatment represents a step toward a more inclusive healthcare system.

Oral health care goes far beyond clean teeth; it reflects a well-cared-for and healthy life. By taking action toward comprehensive and inclusive care for our patients with disabilities and looking beyond barriers, we not only transform smiles, we transform lives. How deep is our commitment to that transformation?

BENEFITS OF MEDDIET, EXERCISE AND SUPPLEMENTATION

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Nowadays, there are numerous complications related to diet. Adequate nutrition and regular physical exercise are essential. Failing to meet sufficient dietary requirements today negatively impacts health, particularly in the elderly population. The Mediterranean Diet (MedStyle) has been shown in numerous studies to play a protective role against risk factors for age-related diseases. (1).

Medicine and health are areas in constant evolution, with recent exponential growth. The Nutrition field has already developed supplements designed to address needs that aren't met by the daily consumed diet, either due to its insufficiency or absorption complications.

The Mediterranean diet is mainly based on traditional meals, often homemade, pictured by a high ingest of unrefined cereals, fruit, vegetables, legumes, and olive oil; moderate ingest of dairy products and alcohol, as well as underconsumption of meat (1).

Physical exercise has become an essential part of daily life, especially for the elderly. It is imperative the implementation of physical activity, conjoining walking 15-20 minutes per day with strength exercises due to the atrophy of the muscles, the risk of osteoporosis, and fractures when falling as age increases. Doing from 30 minutes to 1 hour of strength exercises is enough to counteract the effects of age and thus be in better shape.

Different cross-sectional studies described positive associations between MedStyle adherence and reduction in free fat mass (FFM). Adherence to MedStyle has been associated with higher bone mineral density (BMD) and it has shown to prevent bone disease; some components of MedStyle can play a role in the prevention of osteoporosis (1).

Current evidence suggests that MedStyle can be employed as a preventive strategy against the development of cognitive decline and dementia. A meta analysis was performed and suggests the first umbrella review, estimating the association between the adherence to MedStyle and 37 different health outcomes including cognitive disorders, metabolic disorders, as well as inflammatory parameters (1).

It is well-established that there is a direct link between diet, the intestinal microbiome, and the immune system. Diet influences the composition of microbiota, which in turn affects the host's health. Research suggests that the daily consumption of probiotics can help address age-related immune system deficiencies, as well as reduce both the incidence and severity of infections in the elderly. (1).

Supplementation with EPA/DHA is found to be effective in limiting obesity development by decreasing body fat, limiting both fat cell hypertrophy and hyperplasia in mice. Evidence reports lipid accumulation reduction in adipose tissues as well as anti-inflammatory effects of mice on high-fat diet with EPA and DHA supplementation. Moreover, omega-3 polyunsaturated fatty acid (PUFA) supplementation is recognized for its positive impact on both functional capacity and cognitive function, especially among the elderly.(2).

Vitamin D3 supplementation was associated with a 15% reduced cancer mortality risk (3). A review identified a 25% reduction in hip fracture among older adults who received vitamin D3 and calcium supplementation. The daily oral supplementation of 800 IU of vitamin D3 plus 1200 mg of calcium is more effective in reducing hip and non-vertebral fractures. It is advisable to review a patient's calcium and vitamin D intake from all sources prior to commencing calcium and vitamin D supplements (4).

Studies have proven zinc supplementation improves chronic liver diseases such as cirrhosis, which is why supplementation may protect functionality, enzymatic reactions with antioxidant benefits, and other essential enzymes that require zinc including DNA and RNA polymerase impacting on liver function and its potential inhibitory role in cancer pathogenesis.

The dosage of supplementation depends on gender. The intake in males is 14 mg/day and in women, 8 mg/day. Zinc is increased in oysters, red meat, crab, pork, hard cheese, wheat bran, nuts and seeds.

There is an upper limit of 40 mg/day for adult women and men from food and supplement sources (7).

Moreover, zinc supplementation enhances the immune system protecting gastroenteral track by improving the phagocytosis of the monocytes. Escherichia coli and other bacteria living in the human body may infect and cause certain diseases, whereas zinc has proven to decrease the frequency of these infections (7).

Magnesium, on the other hand, has shown to improve mood, stress, anxiety and depression. This might help the elderly improve their quality of life (5, 6).
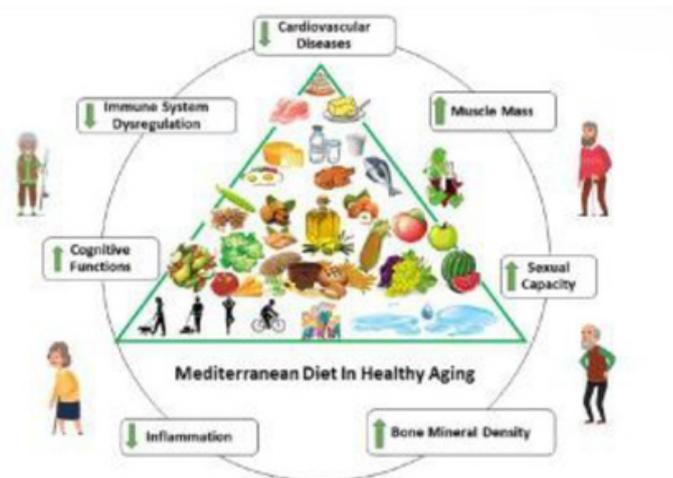
Mediterranean diet in healthy aging

In conclusion, understanding that nutrition is an integral part of life is essential, as it can be applied to all stages of health. This is particularly significant in adulthood, where the Mediterranean diet offers multiple health benefits including regulating metabolic disorders, cognitive functions, and improving various organs and systems such as the musculoskeletal, and cardiovascular systems. These benefits collectively support healthy aging. When combined with regular physical activity and good habits such as high quality sleep contributes to a healthier lifestyle and reduces health risk problems.

The use of supplements becomes important when recommended or prescribed by a doctor to address specific body needs. In severe cases, supplements can fulfill critical deficiencies. However many supplements require further research to establish full credibility, as their effects can vary widely, leaving a huge field yet to be explored.

Good nutrition and exercise are the pillars of health

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Why not consider becoming a doctor?

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The goals we set are fulfilled, and the dreams we hold are lived with our eyes wide open. For many of us, pursuing a career in medicine has been our main aspiration since childhood. We often envision ourselves as those white-coated heroes, carrying stethoscopes, or dreaming of becoming doctors for children. However, no one truly prepares us for the complexities of medicine —not only facing it with our eyes open but also with a heart that is at risk of closing off.

As medical students, we often find ourselves unprepared to manage specific situations firsthand. We observe silently or support our peers, only stepping in when given opportunities to engage with patients in basic ways, such as checking vital signs, taking medical histories, or practicing suturing. But what happens when we are merely spectators to injustices or pivotal life moments unfolding before us? In my view, these experiences are what ultimately shape us as physicians. Often, it is the seemingly insignificant incidents that inform our future critical decisions.

I remember a clinical case involving an average-built man with brown skin who appeared visibly exhausted. He entered the consulting room where I was merely observing. This man had every reason to live, except for an alarmingly low lymphocyte count of only 4/mm³.

He had been diagnosed with HIV four months earlier after his partner tested positive, and he had adhered strictly to his treatment. Just the previous month, he had visited a doctor in perfect health with an undetectable viral load. However, his life had changed drastically in a very short time.

That day, I learned an invaluable lesson: timely patient education can prevent tragedies like this. This man, who worked in healthcare, had developed advanced Kaposi sarcoma on his limbs, marking the beginning of a complex battle ahead. The physician overseeing his care was exemplary in both treatment and diagnosis, but by the time we reached this stage, options had become limited. The primary recourse was to identify, diagnose, and refer him to the National Center of Cancerology. Despite the professionalism and empathy with which he was treated, the fragility of human life became abundantly clear at that moment.

Why not consider becoming a doctor? It requires immense strength to look into the eyes of those facing unfavorable prognoses and to offer the necessary care as positively as possible.

Being a doctor involves not only possessing clinical knowledge and technical skills but also the ability to establish rapport during the most vulnerable moments in people's lives. We must be prepared to educate, listen, and assist—even when situations seem insurmountable.

Resilience is also essential. Throughout our careers, there will be days when patients, out of frustration or fear, may speak badly of you behind closed doors. Yet, despite this, you must greet them again with the same warmth and joy. Learning not to take these situations personally is a lesson that takes time, but it is crucial for maintaining emotional balance in this profession.

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The year of being NORE: all the challenges and the accomplishments

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The world has always been a strange place, full of challenges and confrontations, of flaws and virtues, also above all: dreams and experiences.

Throughout this year I have had the blessing of leading and serving in this wonderful Exchanges Committee. I have managed to experience all the emotions a human being could feel: joy, uncertainty, sometimes worry, but always with hope and ambition. The obstacles that have been faced were in their majority searching to secure a future to the association and also our present have been challenging in several ways, nevertheless with all the happiness I can express, it has been a brilliant year for SCORE. It has undoubtedly been through a lot of hard work by my Local Officers who are the real reason it all works.

If we look back in time, it is easy to say (for someone who is not familiar with our duty) that almost all the work AMMEF A.C. manages is a bureaucratic movement, however from my personal point of view it is much more than that. AMMEF has represented for me a social group to which I can belong and contribute, while at the same time I have the fortune of being able to take advantage of endless opportunities that all the members have and offer them to anyone else.

It becomes a safe space and trusting environment, which helps you to be able to leave your comfort zone and at the same time it would become your favorite place to grow in a short period of time. It is the perfect locus to develop beyond academia and whatever we could imagine.

The association has been for me that, a space where I have met an amazing quantity of people, but above all, is where I have met myself and a fantastic group of people who are willing to dedicate their time towards a goal that we will hardly enjoy in our stay as physicians in training, which will be taken advantage by people who may not even know that we exist, but hopefully their experiences could become significant as to define some aspect of their entire life.

In the words of the podcast "Ficción" from 2022, "we are unsung heroes to future strangers", I think the feeling of belonging to this association is very similar to that phrase: the reality of work being done internally may be far less impressive that you may think, however it is also far more meaningful than we could ever imagine. Leaving a legacy for the future ones can benefit the opportunities and being better than us.

In my particular experience, if I could travel to the past and have a conversation with my 10 year old self, maybe I would be a little worried, nonetheless with no doubt, so proud; the accomplishments that since that time I reach. Thinking in the Gerardo that worked in the construction now has visited numerous cities in his countries trying to achieve academic and personal goals the become more than a dream came true. And with no doubt I can be proud of myself and be helpful to the association.

If something life has taught me is that it is more worth it to enjoy the path to get our goals than the outcome itself. Thinking in my future, I will stay with the memories of everyone I know, all the familiar people and with all the love I learn to give and receive; with the ones that believed in me and of course with all the memories for the rest of my life. This year defines me and change the path of my life. If myself and my incredible partners reach this point of our life, I am sure that you could also get your goals and become even better than us, Óscar (SCORE pet) and I believe in you.

If I could ask you one more favor, would be to follow the phrase that helped me through my year: Keep looking the EXTRA in the ORDINARY.

Surgical innovation in Eastern Europe: Insights from an exchange in Poland

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Surgical innovation in Eastern Europe: Insights from an exchange in Poland

August 5th, 2024 marked the beginning of a journey that changed my view on Medicine and enabled me to understand the significance of cultural diversity and technology in the medical field. My destination was Poznań, Poland where I spent a month working in the Cardiac Surgery and Transplantology Department under the guidance of Doctor and Professor Tomasz Urbanowicz. I collaborated on a project focused on the Neutrophil Extracellular Traps (NETs) in patients with Left Ventricular Assist Device (LVAD). This experience not only meant an academic challenge but also encouraged my personal and professional development.

Immersion in the Operating Room: Key Learnings

Since the first day, my time in the laboratory highlighted the importance of investigation as the motor to medical progress. Processing samples and analyzing data allowed me to refine my scientific skills. One innovative aspect that amazed me was the advanced system of labeling and personalized coding for each sample designed to guarantee precision and traceability in clinical studies.

This approach demonstrates how attention to detail may transform the results of the investigation. In the operating room, I witnessed complex procedures like Coronary Artery Bypass Graft Surgery (CABG) and Aortic Valve Replacement (AVR).

I experienced the prioritization of the medic's well-being in how the medical personnel generally used footwear "Crocs" style and short-sleeved doctor coats. These details reflect a combination of commodity and functionality. Moreover, they contributed to an efficient and secure surgical environment. I was also impressed by the empathy of the personnel in the hospital, who took action to ensure my colleagues from Oman had access to adequate surgical uniforms respecting their religious beliefs. This gesture accentuates the importance of an inclusive environment that appraises cultural diversity.

Innovations in Surgical Management

One of the highlights of innovation was the patient management with LVAD, which is crucial for those who suffer from advanced heart failure. These devices not only improve the quality of life but also mean a possibility for heart transplantation. According to Llerena-Velastegui et al., LVAD increases significantly the survival time in patients with end-stage heart failure, emphasizing the role of advanced technology in contemporary medicine. (1)

I was also stunned by the implementation of Robotic Assisted Surgery, a procedure that reduces recovery time and enhances surgical precision. According to the European Journal of Cardio-Thoracic Surgery, the adoption of robotic systems has grown by around 25% in Eastern Europe in the last five years, revealing the commitment to clinical excellence and innovation. (2).

Comparison with the Mexican Surgical System

Comparing the surgical systems between Poland and Mexico revealed challenges and opportunities. In Poland, investment in advanced technology and continuing education are the bases of their success, while in Mexico the budget constraints hinder the adoption of similar innovations.

However, there are pilot initiatives in Robotic Surgery and surgical training efforts that underline the potential to align with global tendencies through greater international cooperation as Tellez-de-Peralta states. (3).

Coexistence and Personal Growth

Beyond medical learning, the exchange was an opportunity to share ideas and experiences with students all around the world. A memorable event was the "National Food and Drinking Party", where each incoming brought traditional dishes of their country. Representing Mexico, I brought "pepitoria" from Sinaloa, "mazapan" -my favorite sweet food-, and "Pulparindo". I also helped prepare "guacamole" and "mole" along with other Mexicans - Grecia and Francisco-. My favorite foods were the cream cakes from Portugal and authentic Italian pasta. This event was a reminder that we all have similitudes and particularities that make us unique.

The time spent outside the hospital enabled me to explore places that left a deep unforgettable mark in my memory. In Poland, visiting the concentration camps of Auschwitz-Birkenau was an impactful reminder of the history of humankind. In Paris, the house of the artist Monet and the Museum of Louvre offered a majestic view of art. Finally, Praga with its delightful architecture fascinated me as one of the most beautiful cities I have ever met.

Final Reflection

This exchange in Poland taught me that Medicine transcends frontiers, connecting with people of different cultures through shared knowledge. The exchange experience allowed me to witness how small actions - from an advanced system of labeling to consideration of medical personnel's well-being- may significantly transform surgical practice.

I also learned great advances in medicine do not arise only from technology but from empathy, inclusion, and continuous commitment to improvement. My time in Poland reaffirmed my belief that international exchanges are an invaluable means of personal and professional development. These experiences not only expand your academic threshold but enrich your capacity to face global challenges with creativity and humanity and find out what we are capable of doing.

This journey meant a reminder that real growth resides at our disposal to collaborate, adapt, and grow together, rather than a learning opportunity. I expect that other students have the chance to live a similar experience as it transforms our perspective not only as physicians but also as a person.

True innovation lies in willingness to collaborate, adapt and grow together

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How many female doctors in Mexico's history do you know?

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Whenever the healthcare field is discussed, commonly we picture it as male doctors or male physicians. Gender discrimination shows that female doctors worldwide face constant injustice, discrimination, and little to no recognition in the field. This persists despite the fact that the primary goal of this science is to safeguard human health from diseases, regardless of gender, beyond being a mere biological difference.

According to Javier de la Torre Díaz, "Systematic studies in bioethics create an essential need for memory and consciousness to support new ideas for approaching all individuals" (1). On the other hand, it is known that women have developed better and more efficient communication channels with peers, patients, and families, allowing institutions to be led by female personnel to improve their relationships and public efficiency. This, in turn, enables them to provide better service by employing their knowledge, hard work, and care while constructing their femininity in a hostile environment.

Society has endlessly dismissed women's moral strength as trivial, perhaps of its commonly generalized historical perspective. Women's contributions are frequently undervalued, remarking certain philosophies and trends that threaten their strength and position.

Graduadas en la ciudad de México	Año de nacimiento/ año de graduación
Matilde Petra Montoya Lafragua (D.F.)	1857/1887
Columba Rivera Osorio (Hgo.)	1873/1900
Guadalupe Sánchez Guerra (Ver.)	1878/1903
Soledad Régules Iglesias (D.F.)	1884/1907
Antonieta Leonila Ursúa López (Jal.)	1880/1908
Rosario Martínez Ortiz (Coah.)	1878/1911
Graduadas en sus estados	
María Castro de Amerena (S.L.P)	1880/1912
Herminia Franco Espinoza (Pue.)	1891/1917
Ma. de los Dolores Rivero Fuentes (Mich.)	1897/1927
Consuelo Vadillo Gutiérrez (Yuc.)	1907/1930
Juana Navarro García (Jal.)	1907/1930
Catarina Olivo Villarreal (N.L.)	1905/1935

Tabla 1.Primeras médicas graduadas en México.(1887-1935)

In our country, the application and acceptance of a woman in schools of medicine is relatively recent in historical terms. Health sector statistics indicate that women studying medicine has increased from 6% to nearly 50% over the last 2 decades. Unfortunately, as today only a few manage to reach positions of high responsibility and decision-making, due to continuous social, cultural and personal challenges.

Matilde Petra Montoya Lafragua, homenajeada en la publicación periódica en el Álbum de la Mujer, como motivo de ser la primera médica mexicana.

Importance of Emotional Well-being of the Physician in Trainee

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As physicians in trainees, learning to manage our emotions is crucial. One of the rewarding aspects of medicine is the opportunity to help people, develop empathy, and consider the perspectives of others—imagine if that patient were a family member and how you would want them to be treated. However, this can become complicated when faced with challenging situations where things may not go as planned. It is also important to cultivate maturity and strong character, especially when delivering bad news or working to improve a patient's adherence to treatment.

In many cases, when we enter medical school, we don't fully consider the challenges we will face, or we may not recognize their importance as we should. However, I believe that coping skills are developed over time. After failing a test or a subject, it's common to feel anger or resentment towards ourselves for not studying harder or to feel sad when comparing our scores to those of our classmates. This experience becomes a lesson: if you fail an exam, you know you need to study harder or organize your time better. At this point, you learn to manage your emotions, as well as the pressure and stress that come with academic demands. I understand that the pressure in college differs from that experienced in a hospital with actual patients, and it's not directly comparable. Nevertheless, it's crucial to prioritize calming yourself to clarify your thoughts, as overwhelming pressure can lead to mistakes and setbacks.

Expressing confidence is crucial because it demonstrates assurance to the patients who consult us. Throughout our training, we may have encountered several challenges that made us feel unworthy or unsure of our place in Medicine. This sense of inadequacy can lead to depression among medical students, which is evident in our environment. However, we must learn to be resilient, understanding that things may not always go as planned. It's important to learn from our mistakes and recognize that a career in Medicine is demanding and difficult. We should focus on visualizing our future, remembering that all the effort we invest will ultimately be worthwhile.

Understanding the importance of emotional well-being is essential for us as physicians. It not only aids us in treating diseases but also helps us recognize the emotional impact on patients and their families. By being more compassionate, we can attend to our patients' needs and concerns, make them feel heard, and give them the attention they deserve.

Our emotions also influence the way we involve ourselves with colleagues, nurses, other healthcare professionals, or even our own family, as adequate management of emotions will facilitate how we perform, and will allow us to get along better with other people. In some ways, this soft skill helps create a pleasant environment with fewer conflicts and better communication.

Handling our emotions has become a fundamental skill since the beginning, as in our professional development for better communication with the patient. During our formation process, we need to recognize and learn to manage these emotions as an essential key to learning from experiences and going forward without losing motivation, thus helping us assert our mental well-being.

Being conscious of our emotions will let us identify our strengths and weaknesses, develop our interpersonal abilities, or improve ourselves to attend to patients more humanely and effectively while taking care of our emotional well-being.

SPECIAL THEME

"HEALTH & TECHNOLOGY"

The employment of AI in medicine: enhancing learning or restricting critical thinking?

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Artificial intelligence (AI) has revolutionized multiple sectors, and Medicine is no exception. For the last decades, we have witnessed the exponential growth of its use. In the medical area, its implementation has become increasingly common, offering valuable tools that can facilitate student's learning process. However, being part of the early generations of medical students with this technology, we encounter many challenges, and it appears to me that the most outstanding is critical thinking.

The high workload between hospital practice and major courses is a problem that, as students, we face daily leading to mental health concerns and even burnout. As of today, there are numerous strategies to lighten the mental burden, like meditation, psychotherapy, and breathing exercises, among others. But, I consider there is another underexplored one and I'm referring to the assistance that AI could offer.

AI can be a useful resource for a medical student's learning process since it can ease work. This technology becomes helpful with brainstorming, which has a positive impact on creativity evolution, as well as improving different areas such as subject comprehension after class, simplifying the knowledge already given. This support could mark the beginning of a new era in medical training, distinct from previous generations.

Nowadays, AI has been used in diverse medical sectors, proving its high potential. For instance, in the Imagenology field assisted AI diagnosis systems have exhibited notable precision in detecting diseases through image analysis such as cancer. This allows us to see that not only AI can facilitate students' learning process, but it is also capable of becoming vital in patients' attention, improving its quality.

Having an extensive amount of information in just one place can be highly beneficial for studying, allowing students to make the most of the time they have and focus on more relevant topics without the need to memorize huge volumes of information.

Nevertheless, I can not help but feel concerned about how fast AI was integrated as a daily tool for medical students. I believe that, while it could be a fundamental aspect of new ways to develop knowledge, currently medical schools have not been able to adapt and generate adequate training for its use.

The above information would pose an important risk. With so little control over AI, students may end up abusing this tool, eventually losing their critical thinking, which I consider essential in today's doctors. This skill makes doctors capable of analyzing, evaluating situations, and making decisions that could drastically change patients' prognosis.

Despite these problems, I believe AI can be well used and transform itself into a vital tool in patients' health. For instance, it could help with "abstraction", a process that allows isolating a concept and understanding it in a more general way. Doctors could employ it to manage information without memorizing it, empowering the prioritization of relevant data. However, education is needed for correct abstraction practice, revealing AI limits. We must differentiate between the imperative knowledge doctors need for medical practice and knowledge that will impulse innovation in the field.

I hope Mexico's schools of medicine adapt to this new era, incorporating previous education of AI to provide students adequate employment along with ethics, theory, practice, communication, and constant quality improvement.

We are the future and inevitably technology is part of it. Preparing ourselves is our passion and responsibility, the reason we aspire to become a doctor. While recognizing the impact it will have on our lives, we still embrace the challenge. AI practice must not diminish humanistic practice and critical thinking, rather it should enhance them by serving as a resource for clinical judgment and not a replacement.

The Medical Internship in the Era of Artificial Intelligence: Impact and Adaptation

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The topic of artificial intelligence (AI) has revolutionized many professions, including the attitudes of workers, and doctors are no exception. Since its emergence in November 2022, AI has transformed how physicians diagnose and treat diseases, as well as how students and healthcare professionals approach their training and daily practice. In this context, the medical internship, a crucial stage in the education of future doctors, stands at the crossroads between academic tradition and technological innovation, as medical interns navigate between the traditional path and adapting to new technologies. This article explores the impacts of AI on this formative phase, analyzing both the benefits and the ethical and pedagogical challenges it entails.

AI has advanced rapidly in the medical field thanks to its ability to process large amounts of data and provide more accurate diagnoses. Tools such as ChatGPT, IBM's Watson Health, and deep learning algorithms have proven useful in medical imaging analysis, clinical risk prediction, and treatment plan optimization. These capabilities can ease the workload of interns by offering valuable information and assistance in clinical decision-making. For example, in a hospital setting where interns must attend to multiple patients while making critical decisions, AI can act as an invaluable support system, ensuring that crucial diagnoses are not overlooked.

Interns face a significant workload, including long shifts, patient management, and the constant need to learn. While this demanding environment is essential for developing solid clinical skills and sound medical judgment, it is undoubtedly challenging. The introduction of AI into this dynamic has sparked both enthusiasm and concern. On one hand, AI tools can facilitate access to up-to-date information, aid in interpreting laboratory results, and provide evidence-based recommendations for patient management. On the other hand, there is a risk that excessive reliance on these tools may hinder the development of critical skills, such as independent clinical thinking and decision-making under pressure.

A crucial aspect of AI's impact on physicians is its ability to personalize learning. Interns can use AI platforms to review clinical cases, practice virtual procedures, and receive immediate feedback on their performance. These tools can also adapt to individual learning needs, identifying areas for improvement and offering specific resources to address them. However, it is essential to ensure that these technologies are integrated in a balanced way, complementing rather than replacing direct supervision and teaching by residents and specialists.

In terms of statistics, there has been a growing interest among medical trainees in adopting AI tools in their daily practice. According to a 2024 study, 56.8% (A, Figure 1) of health science students reported having basic knowledge of AI in healthcare, 19.8% (B, Figure 1) described themselves as moderately knowledgeable, and 21% (C, Figure 1) admitted to having no knowledge of AI at all. Additionally, 66.7% indicated that the primary advantage of AI is providing faster care, while 61.7% highlighted its ability to reduce consultation times. Another study revealed that over two-thirds of students agreed on the necessity of including AI in medical training (71%).
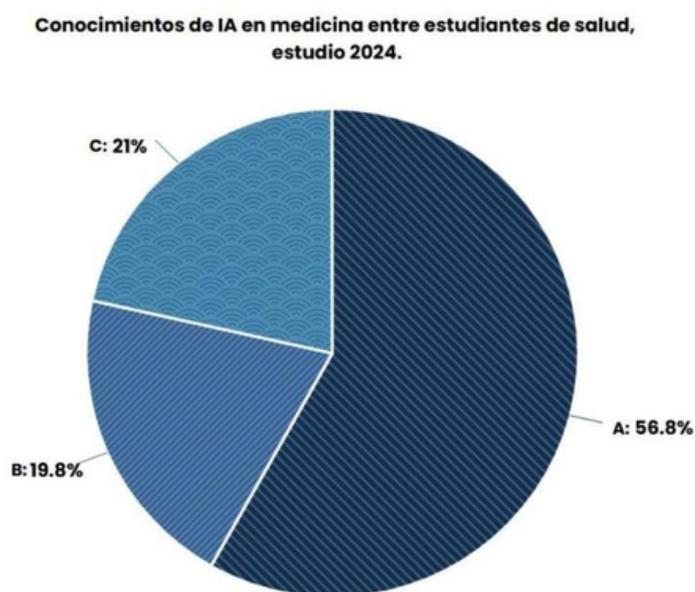
Figure 1. Conocimientos de IA en medicina entre estudiantes de salud, estudio 2024.

The use of AI has also sparked debates about its impact on the doctor-patient relationship. While these tools can streamline administrative and clinical processes, there is a risk of dehumanizing medical care. Interns, as future doctors, must learn to balance the use of advanced technologies with the need to maintain effective and empathetic communication with their patients. Training in digital and ethical competencies will be essential to prepare future physicians to face these challenges.

One of the most controversial aspects of implementing AI specifically in medical internships is the issue of technological dependence. Although AI can be a powerful tool, excessive reliance on it could lead to a decline in interns' ability to perform diagnoses and treatments based on their own knowledge and experience. This concern is particularly relevant in situations where technology may not be available or in complex cases that require a more intuitive and experience-based approach. For this reason, it is crucial for internship programs to adopt a balanced approach, fostering both technological learning and the development of traditional clinical skills.

From an ethical perspective, the integration of AI in medical education raises important questions about patient data privacy and security. Interns using AI tools must be aware of the risks associated with handling sensitive information and ensure compliance with data protection regulations.

Additionally, it is vital for these technologies to be transparent and explain how their recommendations are generated to avoid misunderstandings or inappropriate clinical decisions.

Artificial intelligence is transforming the landscape of medical internships, offering significant opportunities to enhance efficiency, accuracy, and personalization in clinical training and practice. However, it also poses ethical, pedagogical, and professional challenges that must be addressed to ensure these tools are used responsibly and effectively. Striking a balance between the use of advanced technologies and the development of human skills will be essential to train doctors capable of meeting the challenges of an ever-evolving healthcare system. As AI continues to advance, it will be crucial for academic institutions and hospitals to adapt their approaches to maximize the benefits of this technology while minimizing its risks. In this way, the medical internship can remain a comprehensive and enriching experience in preparing future healthcare professionals.
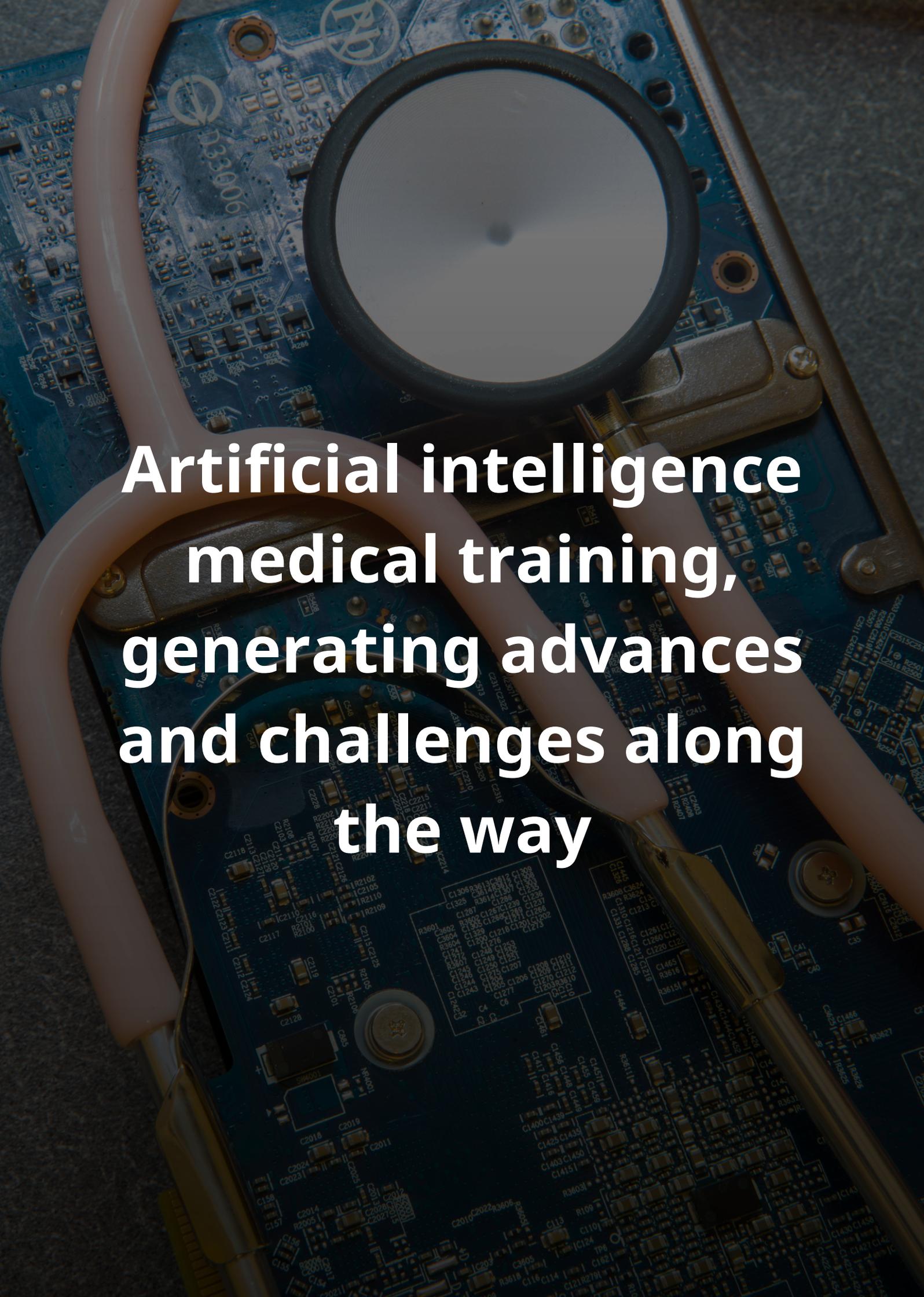
Artificial intelligence medical training, generating advances and challenges along the way

The Use of AI in Medical Education: Opportunities and Challenges

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Most students currently make use of tools such as OpenAI's ChatGPT, which can be an advantage, if used as another resource, to facilitate the tasks, the understanding of the topics, for example, with Chatbots that can explain in a simple way topics that could be complicated in medicine, or ask them to summarize information, even to give us an exam or feedback on the topic we are studying, etc. This way of using it could help us to grow as students, however, we must maintain critical thinking, because not all the information produced by the AI is correct, In an article published by the journal JAMA in 2023, where it was shown that not all the answers, in the medical field, provided by Chatbots are correct, in some cases there were information biases or errors, therefore, the information generated should be continuously verified in reliable sources. (1)

Another disadvantage of the use of these large language models (LLM) such as ChatGPT is that as they are quick information search tools they can be used to cheat in exams, which would generate a loss in academic performance, in addition to a deficient knowledge of future medical professionals. Moreover, being deep learning models trained to generate human-like texts, they have been used in cases of academic fraud, where published articles turned out to be authored by AI such as ChatGPT, which makes this situation

more worrying, because the texts generated by AI usually go unnoticed, however these texts have clear errors, because Open AI creates texts using all the content in its database without an understanding of the real world, so you should not make use of these texts in their entirety, but rather use AI as an assistant not as another author.

Considering this, the use of these tools are effective but also counterproductive, because they can facilitate many tasks, nonetheless as healthcare students, we must maintain critical and analytical thinking, without replacing our skills just because AI makes it easier, consequently, this would make us dependent on these tools preventing us from improving as students and acquiring the skills that in the future will make us good doctors.

Not all students know enough information about AI functioning, a very clear example is the quick searches of information through Chatbots, because it is easier than researching in more reliable sources such as books, Pubmed or Medline, this can be a great advantage because most of the time it provides correct information but responds as well as the user makes the request, this emphasizes the importance and sensitivity of the indications, and the need to train students in AI indication literacy and engineering so that the request is formulated correctly and the quality of the answers is not

affected, this point is very important because it can not only be used in medical education but in the future in practice we could consult the AI to guide our medical diagnosis, of course it can't replace our critical thinking, but it strengthens our ability as clinicians.

Therefore, training to understand the fundamentals of AI deep learning could be a valuable tool, furthermore this knowledge could be included into the curriculum, for proper use of these technologies and understanding the potential of AI in medical education and healthcare. The limitation here is that we as medical students aren't familiar with the basics of AI such as data science or the ethical and legal issues that may arise in its use, therefore, this knowledge can't be carried from physician to student, unless the physician is familiar with these technologies. I think that to understand these issues, the student should have access to AI training from a subject matter expert. So, it would be beneficial to have an ongoing conversation about humans working with AI.

In addition to the lack of knowledge in this field, there could be a distinct disadvantage for those healthcare students who do not have the resources to use AI, creating an inequality between students and future professionals in the field.

Despite the limitations that exist regarding the use of AI in medical education, the advantages are clear, as a "guide" in decision making, learning resources, for example, diagnostic simulators or to access medical information more quickly, among other applications. However, inappropriate use is still the protagonist, hence the need to integrate this knowledge into universities and make the student community avoid over-dependence on these technologies, encouraging their use to complement our ideas and streamline workflow.

In conclusion, AI as a study tool can be valuable and as an assistant to strengthen our capacity, without replacing our intellectual capacity, but as a complement to reinforce our learning and professional performance. Therefore, developing skills to use AI in a critical way would benefit us not only in the academic field, but also in the future in the professional field and educational institutions must lead to this change in the way we learn, incorporating the responsible use of AI in the curricula and promoting equity in access to these technologies.

Artificial Intelligence in Medicine: Assistance or Replacement?

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Artificial Intelligence (AI) is becoming increasingly prevalent in both academic education and healthcare management. We have either personally experienced or observed colleagues relying on AI for creativity, summarizing complex texts, quickly resolving doubts, optimizing online research, and efficiently creating graphic resources. AI is emerging as an essential tool, widely adopted in daily life, particularly within the academic domain.

This type of thinking has been studied regarding how the coexistence of doctors and artificial intelligence will look in the near future. It has been found that medical specialties and healthcare activities most at risk of being replaced by artificial intelligence are those that involve repetitive tasks. However, there is also talk of a reinvention of these specialties, where the focus shifts back to patient care rather than the analysis of repetitive data, returning the medical practice to its core of patient-centered care. (1)

However, there are also arguments against the idea that artificial intelligence will eventually replace doctors, and they are based on the use of medical intuition. This 'sixth sense' that makes scientists 'uncomfortable' is nothing more than the experience gained over years of training to diagnose, treat, and assist patients. While evidence-based medicine should always be the priority, medical intuition is an important factor that assists emergencies. (2)

The above does not suggest that medical practice should rely on experience; rather, it echoes the well-known saying, 'treat patients, not diseases,' which could be rephrased as 'treat patients, not data.'

We could consider that a tool performing data analysis with immediate information response could be reliable for patient care, but it also dehumanizes medical practice, which cannot exist without humans. We do more than diagnose and prescribe treatment like a machine; we are present in people's most vulnerable moments and help them find comfort during difficult times.

Medicine goes beyond being a machine that 'knows it all,' as there are aspects that a computer simply cannot address. The real concern with artificial intelligence lies in the potential for eliminating repetitive tasks and the analysis of large volumes of data, and even then, it is unlikely to be fully realized since the human element will always be essential.

Artificial intelligence is a tool, a companion that will support us in our practice rather than replace us. To adapt the words of Marcelo Gálvez Moya: AI will not replace doctors, but doctors who use AI will replace those who do not. (3)

Artificial intelligence is a tool, a companion that will support us in our practice rather than replace us.

Who (or what) will provide the consultation?

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Many readers are familiar with the story, somewhat like a fable, about the first human appearance and the evolving concept of humanity, which remains without a precise definition. The discovery of a broken and healed bone has often been interpreted as evidence of an early human actively caring for another, a decision to help an individual facing a life-threatening condition, even in the Paleolithic era. Whether truthful or a folk legend, it highlights our inherent tendency to look out for one another, a defining trait of what it means to be human.

Moreover, it is common to highlight the use of tools in our activities as we evolve as a civilization. The practice of medicine, from its beginnings, has involved techniques and instruments, even primitive ones. Therefore, the synergy between medicine and science is not just beneficial; it is inseparable and essential. Medicine, as we know it, is not merely an art—it is the result of the art of technique, in other words, technology.

Computer invention involved an authentic revolution in all instances, not just in the industrial field. As a data management machine, increased exponentially scientific progress by enabling the storage of enormous volumes of information that would have been impossible for human limits. Medicine likewise benefited from modern technology with CT scans or magnetic resonances, changing the methodology for diagnosis and treatment.

Several brilliant minds who witnessed computers' genesis, also predicted its future development. Ada Lovelace and Alan Turing anticipated that computers would eventually perform intelligent responses to their input data. They intuited that they would not be eternal information-processing devices, but could make decisions. John McCarthy coined the term "Artificial Intelligence (AI)" to unite efforts and establish an action field of this idea.

In short, AI involves the integration of logical, mathematical, and computational procedures designed to create machines that simulate human intelligence, capable of performing autonomous and adaptable learning processes. Since the COVID-19 pandemic, AI has been evolving alongside a global digitalization trend that continues to expand into our daily lives. From fun photo filters and text chats to analyzing vast amounts of data for global decision-making, it is clear that AI is not only a useful tool but, like other technological inventions, is gradually becoming indispensable.

For AI's definition, I delimit the extension of its current role in medicine. Not every monitorization device includes it, even those for telemedicine, still realize their measurements by pre-existed algorithms.

The majority of electronic administration systems don't rely directly on AI; it is specifically used in information processing outside of the core administration. Surgical robots, often featured in Vanguard technology publications, are not operated by AI but are controlled by the surgeon, who adjusts the trajectory and precision using mathematical analysis algorithms.

In contrast, artificial intelligence is used as an assistant in diagnosis, performing analysis of laboratory results and imaging studies; in research, evaluating data from databases; in recent monitoring devices, predicting clinical conditions; and as a valuable tool for personalized medicine by offering a deeper understanding of the specific conditions and needs of each individual, among other functions. This significance is highlighted in recent publications and news reports that often present alarming commentary and impactful, yet imprecise, information, which interferes with the understanding and appreciation of AI's true impact on present and future medical practice.

As in all fields, healthcare workers often show defensiveness toward AI's progress in this sector. From the completion of academic tasks through automatic text generation to the consultation of questions with extensive language models, their growing application in medical research, and their direct involvement in roles traditionally reserved for doctors.

It is interesting to note the comments from doctors and healthcare workers who view AI with fear or disgust, questioning its growth in medicine and bluntly asserting that it is a technology that could never reach a sufficient level of precision to trust medical decisions, insufficient to provide accurate diagnoses and treatments, or even offer consultations.

While not as captivating, many healthcare workers (both students and professionals) lack knowledge on how to properly utilize this tool. They have not explored its potential future applications in medicine, often observing it from a distance or drawing quick conclusions without thoroughly analyzing or investigating the necessary information to form a scientific perspective.

It is not the increasing reliance on machines for productive, administrative, and service activities that truly makes us fearful. No, because we blindly trust the vehicles we use for transportation, we don't question the functioning of diagnostic and monitoring devices, and we are not surprised by the vast number of machines involved in running our hospitals. We are even less concerned with the machines necessary for the functioning of the internet and telecommunications. As with every technological dilemma, the media and debates are flooded with scenarios in which modern technology eliminates jobs and threatens the survival of our species and the planet. We have faced this before and dealt with it easily, because, in retrospect, the problem has never been the specific invention or its applications. The problem lies in the structural changes in the economy, politics, culture, and society.

What differentiates technological disruption from artificial intelligence? Until now, we haven't felt the need to stop and reflect on our existence and what defines us as individuals. Increasing productivity has led us to believe, often unconsciously, that philosophical introspection should be reserved for our brief breaks, even deeming it unnecessary and relying on the work of classical thinkers. AI not only requires us to rethink concepts like intelligence and consciousness to better understand its possibilities and limitations but also demands an urgent reevaluation of these concepts, as well as others, such as humanity.

This is the type of preparation society needs to undergo in order to effectively control and make the most of this tool for the common good. When we truly understand our role in society and humanity as a whole, it will guide us to leverage our abilities and inventions. Only then will artificial intelligence become just another tool at our disposal—one that is currently undergoing a revolution and will ultimately transform our entire way of life.

Focusing on the question posed in the title, it is clear at this point that the issue is no longer whether artificial intelligence is capable of performing in medicine, as it has already demonstrated its precision and effectiveness in the field. The real question is about the new concept of medical care, taking into account every detail involved; from the role of the doctor and the healthcare environment to the prescribed procedures and even the patient's role.

Until now, we have comfortably defined the doctor as the one who provides diagnoses and treatments to address health conditions. However, with such an ambiguous concept, it is easy to conclude that a machine could easily take on that role. As doctors, we are more than just providers of health services, we are humans helping other humans. We feel pain, we suffer, and we understand the value of health. Artificial intelligence does not. That's the fundamental difference between a machine and a human. If we focus on humanity and value medical care as a key pillar of human well-being, then it will be a human doctor who provides consultation.

If we focus on humanity and value medical care as a key pillar of human well-being, then it will be a human doctor who provides consultation.

A new path towards the digitalization of the National Health System in Mexico

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Mexico's current digital transformation begins with the development of optimal solutions required by the population and its diseases. A more notable starting point can be identified after facing the aftermath of the COVID-19 pandemic, which exposed urgent issues that needed immediate attention through a strict integration between the reform of the Mexican Health System and Information and Communication Technologies (ICT). The new National Health System is a framework based on social and preventive medicine, inspired by the Bismarck model. Defined as a political strategy focused on reducing segmentation, fragmentation, and heterogeneity in healthcare services, having as its pillars: universality, equity, and quality of services.

Demographics and epidemiological transition aimed to adopt: Public Health Informatics, The Electronic Health Record (EHR), Picture Archiving and Communication Systems (PACS), and Clinical Decision Support Systems (CDSS).

Among the main objectives are enhancing service capacity through improved infrastructure, equipment, and trained staff. Healthcare workers will receive ongoing training and education on modern technology while ensuring ethical handling and protection of personal data.

Using a shared database also solves a major issue of the previous National Health System: the heterogeneity of care across different units and the inaccessibility of patients' clinical records. This disparity often resulted in prolonged medical appointment intervals, limited access to timely check-ups, misdiagnoses, and inappropriate treatments.

Document digitalization is currently in its early stages and is expected to grow alongside the establishment of the new reform of the National Health System. Plans include coordinating inter-institutional actions to strengthen the technological framework and create a database to serve the Mexican population. This process is regulated by the General Archives Law, which establishes guidelines for the management, preservation, and possession of records, regardless of the institution responsible for their use and safekeeping.

Some inequities and challenges still lack clear solutions regarding how they will be addressed, what regulations will govern them, and which legal and ethical frameworks will manage them. A clear example is Artificial Intelligence (AI), which is not intended to replace humans but to serve as an assistant in reducing errors, advancing research, and supporting disease prevention and follow-up.

Mexico is approaching the so-called 'Fourth Industrial Revolution'; however, there are still obstacles preventing full adaptation to these new technologies. One significant challenge is that the Mexican economy does not allocate a fixed percentage of the GDP for this purpose. Nonetheless, efforts are underway to develop an economic growth model that evaluates alternative trajectories for the adoption of AI in capital production.

Undoubtedly, the strong integration of sectors within the nation will lead to remarkable outcomes for its development. The use of modern technology applies not only to the medical field; it involves a multidisciplinary adaptation where knowledge is accessible to all individuals for its application.

Mexico is facing a new horizon in healthcare, with many models being changed and adapted to focus on individualization and patient approach. Many of these changes will not be reviewed in the short term, nor are they eligible to be considered as a single indicator. Continuous audits are required, especially using data and technology, which will be managed by a server, yet it is still unclear whether it will be based in Mexico or abroad.

Use of ChatGPT by the Population for Self-Medication: Beneficial or Harmful?
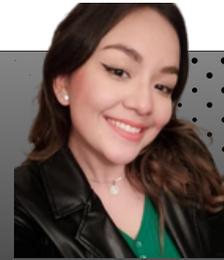
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Artificial intelligence (AI) has entered our lives to revolutionize the world as we know it, streamlining processes and replacing jobs previously performed by humans. While for many it may represent a benefit and a tool to improve the efficiency and effectiveness of many activities, in the field of medicine, this is not entirely true. It must be acknowledged that AI has contributed many benefits to healthcare, from enabling early breast cancer detection by identifying lesions that would be invisible on mammograms, to predicting dementia, among many other advancements. While the immense utility of this tool cannot be denied, there is one issue in which it is not beneficial but rather detrimental— a truly concerning situation that has not been addressed: self-medication.

ChatGPT is an AI tool that provides immediate responses to any question posed. It is remarkably easy to access, and for patients who prefer not to pay for consultations because they consider their symptoms not "serious enough" to visit a doctor, or simply due to laziness, it often serves as a convenient way to obtain answers to "treat their symptoms." Let's be honest, in today's world, we like things to be easy and fast, and what better than consulting a tool that has gained a reputation for being highly effective? The problem arises when people do not take into account all the complexities behind a diagnosis, and worse yet, behind a treatment.

In in-person consultations, it is widely recognized that patients often believe they know more than the doctors, as seen when patients demand antibiotics for a simple cold. This makes it easy to believe that in the future, as this AI tool becomes more widespread, it will become more common for patients to specifically ask for what they want, just so they can be handed the prescription after discussing it with ChatGPT.

The problem with using ChatGPT for self-medication lies in two key issues: seeking a diagnosis and treatment from AI, and self-medication itself. First, a diagnosis must take into account various variables such as signs and symptoms, gathered through a directed interview aimed at forming a hypothesis; comorbidities or other data that can only be identified during a physical examination by a qualified doctor— details that patients do not provide when formulating questions to ChatGPT.

The good news is that when you ask for a diagnosis, the AI does not give you a definitive one. Instead, based on the symptoms, it provides a list of possible conditions. On the other hand, if the patient asks for a treatment, AI may suggest solutions without considering the prior mentioned variables, which could result in the patient worsening their condition. Dosage, side effects, and drug interactions are critical factors that need to be evaluated to ensure that the patient avoids preventable complications when seeing a doctor. This complicates the work for physicians treating the patient later, as the incorrect treatment may require more invasive or risky procedures, and if things go wrong, patients may blame the doctor for "negligence" for not being able to resolve the consequences of their own decisions.
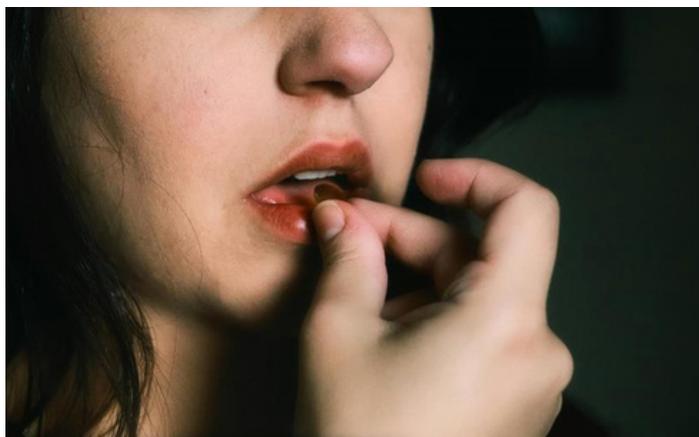
While AI is a useful and beneficial tool that enables extraordinary achievements, with this power comes great responsibility, and we must not abuse it. Although its ease of use and speed in providing responses make it an attractive option for many, what guarantees that in the not-so-distant future, it won't harm us more than it helps? We cannot know that, but we can predict it. Many people, to avoid consulting a doctor, prefer to turn to these tools. However, health is a delicate matter that requires human reasoning, something no machine can fully replace. As creators of these technologies, we must be aware that excessive reliance on AI could lead us into problematic situations, especially if the day ever comes when machines replace even doctors. Therefore, we must use AI responsibly, as a resource to complement our knowledge, not as a substitute for the years of study and experience of medical professionals, who are the true experts in the field.

New Learning Methods: Advantages and Applications of Medical Education Platforms in Conventional Medical Training

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Nowadays, medical education worldwide is facing the challenge of adapting to the demands of an ever-evolving technological environment. While conventional medical teaching, based on in-person classes, clinical practice in real-world settings, and limited methodological resources, has been the standard for decades, digital platforms and resources are emerging as an innovative alternative that can complement and, in some cases, revolutionize our training as healthcare professionals. These platforms offer global access, flexible schedules, and interactive resources, such as clinical case simulations and virtual interaction with multiple resources through databases, among many other tools that facilitate and enhance individualized learning.

However, conventional medical education continues to be essential for the development of clinical and, above all, ethical skills through direct interaction with patients, real hospital environments, and healthcare professionals.

In this context, achieving the integration of both teaching modalities promises to build a hybrid educational model capable of meeting the needs of students and the profession in a dynamic, globalized environment. This will provide us with more tools to remain constantly updated and as competent as possible.

Among the main advantages and applications of digital platforms in medicine are:

- Access to academic and bibliographic resources: Digital platforms provide access to a vast collection of books, scientific journal articles, case studies, and clinical guidelines. This is fundamental for students to stay updated with the latest advances in medicine without the limitations of physical libraries. Platforms such as PubMed, UpToDate, or Google Scholar allow for quick and efficient searches.

- Simulation and practical learning: Medical simulation platforms enable students to practice procedures virtually before performing them on real patients. Software like SimMan and other augmented and virtual reality simulators are examples of how technology can offer practical experiences, from interpreting medical images to practicing surgical techniques, without risk to patients.

- Interactive education and online courses: Medical students can access massive open online courses (MOOCs) on various medical topics through platforms such as Coursera, edX, or Khan Academy. These courses, which range from basic biology fundamentals to advanced surgery and pharmacology topics, complement traditional education and allow students to delve into areas of personal interest.
- Collaboration and communication tools: Digital medical platforms also facilitate collaboration among students, professors, and healthcare professionals. Through forums, chats, and videoconferences, students can discuss clinical cases, resolve doubts, and share experiences with their peers. Additionally, some platforms allow for online tutoring and mentor feedback, enriching the learning experience.
- Personalized and adaptive education: Many platforms allow the creation of personalized study programs tailored to each student's needs. Adaptive learning tools adjust content based on the student's performance, helping identify their strengths and weaknesses. This enables medical students to progress at their own pace and focus on topics that require more effort or are of greater interest to them.

- Facilitation of clinical teaching: Digital platforms also serve to enhance clinical teaching. Tools such as electronic medical records (EMRs) and digital radiology allow students to access and analyze patient data in real time, improving decision-making and clinical practice learning. These tools also enable more efficient tracking of student progress.
- Continuous professional development: Medicine is a constantly evolving discipline, and digital platforms provide a pathway for continuous professional development. Students can access webinars, conferences, and specialized training courses, allowing them to stay updated with the latest research and medical practices, which is essential in such a dynamic field.

In summary, digital medical platforms offer medical students a variety of resources and tools that enrich their learning, improve the quality of their training, and provide innovative and accessible experiences. As technology continues to advance, these platforms are expected to play an even more central role in medical education, enhancing the preparation of future physicians to face the challenges of the real world.

Surgical Simulators and Training in Realistic Scenarios: A Revolution in Medical Education

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In the rapidly advancing field of technology applied to medicine, surgical simulators have emerged as fundamental tools transforming medical training. These devices have not only raised the standards of education but also redefined how future surgeons acquire the skills needed to face the challenges of the operating room.

Simulation in Medicine: A Fundamental Pillar

Medical simulation has its roots in aviation, where pilots use simulators to train under controlled and risk-free conditions. In medicine, this technology has found fertile ground for developing tools that faithfully reproduce clinical and surgical scenarios.

The use of simulators allows students and healthcare professionals to practice complex procedures, improve decision-making, and learn from mistakes without endangering patients' lives. Additionally, it provides a safe environment to evaluate competencies and refine techniques before applying them in real situations. At the same time, it promotes a faster learning curve by exposing trainees to scenarios that may be rare or difficult to encounter in daily practice.

Technology in Service of Precision

Modern surgical simulators combine virtual reality, augmented reality, and high-fidelity physical models. For instance, laparoscopic simulators utilize sensors and haptic feedback to recreate the sensation of operating on human tissues.

More advanced simulators include virtual patient models that dynamically respond to surgical interventions, allowing practice ranging from simple sutures to complex procedures such as transplants or robotic surgeries. These innovations not only enrich the learning experience but also reduce the time required to achieve clinical competency. Furthermore, the inclusion of technologies such as 3D printing has enabled the creation of personalized anatomical models based on real patient data. This facilitates the design of specific training programs and enhances the understanding of anatomical variations and their relevance in complex cases.

Realistic Scenarios for Authentic Challenges

Training in realistic scenarios offers an immersive approach that replicates real-world situations, from trauma emergencies to unexpected surgical complications. In these environments, students work as a team, develop communication skills, and apply knowledge under pressure.

A notable example is the use of simulation rooms that mimic actual operating theaters, equipped with monitors, surgical instruments, and interactive mannequins. These facilities enable the recreation of medical crises such as massive hemorrhages or cardiac arrests, challenging participants to respond efficiently and effectively.

This type of training also promotes interdisciplinary collaboration by involving various specialties in solving the same case, thereby strengthening teamwork and joint decision-making.

Advantages and Challenges

The adoption of surgical simulators offers numerous benefits:

- Reduction of medical errors: Students can make mistakes and learn from them without fatal consequences.
- Repetitive practice: Trainees can master specific techniques through controlled repetition.
- Inclusive access: Democratizes learning by providing training opportunities in resource-limited settings.
- Personalized training: Adapts scenarios and cases to the specific needs of the trainee.

However, challenges remain, such as the high cost of acquiring and maintaining equipment and the need for specialized training to use these tools optimally. Additionally, integrating these technologies into established academic curricula without displacing other equally important learning methods poses a significant hurdle.

The Future of Surgical Simulation

The evolution of surgical simulators promises even more innovations. The integration of artificial intelligence will enable personalized training based on each trainee's needs, while the development of toxicological models could simulate physiological responses to various conditions.

Another trend is the creation of online platforms that combine virtual simulation with distance learning, making high-quality training accessible to healthcare professionals anywhere in the world. Similarly, data collected during simulation sessions could be analyzed to identify learning patterns and optimize training programs.

In conclusion, surgical simulators and realistic scenarios represent a revolution in medical education. By empowering professionals with practical skills and confidence, these tools contribute not only to saving lives but also to ensuring a safer, more equitable, and more efficient medical future.

Artificial Intelligence in Healthcare: Transforming the Future of Medicine

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Artificial intelligence (AI) is rapidly transforming our lives, and the healthcare sector is no exception. From faster diagnoses to personalized treatments, this technology is revolutionizing the way we understand and approach healthcare. But what does this mean for us as patients, families, or professionals? Are we prepared for the ethical and social challenges that accompany this technological revolution?

AI is already making a significant impact on early disease detection. AI programs are being used to analyze X-rays and MRIs, identifying signs of cancer that might go unnoticed by the human eye. This means thousands of people could receive earlier and more effective treatments. Can you imagine a future where a simple app on your phone could analyze your data and warn you about potential health risks?

Additionally, AI enables highly personalized treatments by studying a patient's DNA to design a unique therapy tailored to their condition. For diseases like cancer, this approach is saving lives and minimizing side effects.

AI-driven tools are also improving hospital systems, from managing appointment schedules to efficiently handling medical records. This not only optimizes resources but also reduces wait times and enhances the patient experience.

However, this technological revolution also brings significant challenges. With such vast amounts of data in the hands of AI systems, privacy becomes a critical concern. What happens if this data falls into the wrong hands? Medical records contain highly sensitive information, and their misuse could lead to devastating consequences, including employment discrimination and blackmail.

There is also the risk of biases in AI algorithms. If the data used to train these systems does not adequately represent the entire population, existing inequalities in access to healthcare could be perpetuated.

In rural or underserved communities, these tools might take years to become available, potentially widening the healthcare gap between urban and rural areas. This raises an important ethical dilemma: how do we ensure that everyone benefits from AI advancements?

While AI can automate many processes, it will never replace the empathy, listening, and connection that only a human can provide in healthcare. The doctor-patient relationship remains a cornerstone that must be preserved.

The future ahead is exciting. Imagine a healthcare system where diagnoses are instantaneous, treatments are tailored to each individual, and emergencies are managed seamlessly. AI could also play a crucial role in public health, predicting epidemics and helping allocate resources efficiently. For instance, during the COVID-19 pandemic, these tools demonstrated their potential by enabling more informed and effective decision-making in record time.

AI also holds the potential to revolutionize medical education.

Advanced simulations could train future physicians in hyper-realistic virtual scenarios, improving their ability to respond to critical situations. Additionally, the analysis of large datasets could accelerate medical research, leading to breakthroughs in areas such as cancer, rare diseases, and mental health.

However, the advancement of AI is not without ethical dilemmas. How can we ensure that these technologies respect privacy and human dignity? Regulation will be essential to ensure they are used fairly and responsibly.

We must also consider the social impact: what will happen to healthcare professionals if some of their roles are automated? While AI is a powerful tool, it must complement human judgment and expertise.Artificial intelligence has the potential to transform healthcare in ways that seemed like science fiction just a few decades ago, but we must not rely solely on technological advancements.

Now it is the time to ask critical questions:
- How can we harness AI to reduce health disparities?
- How can we ensure that these tools are developed with deep respect for privacy and human dignity?
- Are we prepared to adapt to a system where technology and the human touch work in harmony?

The future of medicine is full of promise, but it also carries great responsibility. If we guide innovation with ethics and vision, we could create a world where diseases are prevented before they appear, treatments are as unique as each patient, and healthcare is no longer a privilege but a right accessible to all. This is our challenge and our opportunity. The true power of artificial intelligence lies not in replacing people but in empowering them to build a more human, just, and hopeful healthcare system. The future begins today, and we hold the key to unlocking it.

Between Advancements and Misinformation: The Ethical Impact of Digital Health

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The digitalization of healthcare services has radically transformed access, diagnosis, and treatment of diseases. However, the misuse of these tools by the general population has given rise to numerous issues that must be analyzed from a social and ethical perspective.

One of the most critical problems stemming from the misuse of digital health is self-medication based on information obtained online. Many applications and websites provide automated diagnoses and treatments that overlook the complexity of individual cases, leading to incorrect decisions that can worsen patients' conditions.

The absence of complementary studies, such as laboratory tests or imaging procedures like X-rays and CT scans, exacerbates this issue. Excessive reliance on technologies offering automated responses creates a false sense of security among users, who may forgo essential procedures necessary for a complete diagnosis. For instance, abdominal pain that requires an ultrasound to rule out severe conditions might be misinterpreted as a minor ailment based solely on superficial symptoms reported in an app.

Privacy is another critical aspect frequently compromised by the misuse of digital health platforms. Often unknowingly, users share sensitive medical data on unregulated or insecure applications, exposing themselves to significant risks such as identity theft or the unauthorized commercialization of their information. Blind trust in unregulated platforms perpetuates a cycle of digital vulnerability, increasing the likelihood of massive data breaches. In this context, it is imperative for governments and organizations to enforce strict regulations and oversight of health applications.

Blind reliance on imperfect technologies, such as artificial intelligence algorithms, also poses considerable risks. While these tools can complement the work of healthcare professionals, their irresponsible use by the population may replace essential medical consultations, delaying accurate diagnoses and appropriate treatments.

The solution lies in promoting responsible education, warning against the dangers of relying on unvalidated information, and encouraging consultation with healthcare professionals. Digital platforms should include clear disclaimers about their limitations, reminding users that no technology can replace clinical judgment supported by objective evidence.

One of the most significant advantages of digital health is the accessibility it provides to healthcare services, especially in remote areas or regions with limited resources. Digital platforms such as online consultations, mobile applications, and telemedicine allow patients to connect with healthcare professionals without needing to travel long distances, reducing geographical and economic barriers.

This accessibility not only improves early detection of diseases but also facilitates the continuity of care for patients with chronic conditions. By integrating digital tools into healthcare, a bridge is created that democratizes access to health services, promoting equity within the global healthcare system.

Regulation must also play a pivotal role in overseeing the development and use of these technologies, ensuring that platforms adhere to ethical and legal standards that protect users. Only through a collective effort can we harness technological advancements to build an inclusive, equitable, and secure digital healthcare system, minimizing the risks associated with misuse while maximizing its benefits. The key lies in integrating technology with personalized and professional care, remembering that medical science is grounded in a combination of technical knowledge, empathy, and evidence-based practices.

The potential of digital health is immense, but its implementation must be guided by ethical principles to ensure proper use. It is essential to foster a culture of shared responsibility among developers, healthcare professionals, and end users.

Critical Reflection on the Use of ChatGPT in Medical Education

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Future doctors, today I invite you to reflect on a tool that has stirred significant debate in academia: ChatGPT. This artificial intelligence, capable of answering questions, generating texts, and providing academic support, promises to be an ally in your education. But to what extent is its use truly beneficial? And what are the risks of relying on it?

A Tool, Not a Teacher

Let us begin with a fundamental truth: ChatGPT is not a teacher nor a replacement for your professors. While it can provide quick answers and help you grasp complex concepts, it lacks the ability to teach interactively or guide your critical thinking. Artificial intelligence operates based on patterns and pre-existing data, which means its responses may lack depth or, worse, be incorrect.

Imagine you are studying pharmacology and ask ChatGPT to explain a mechanism of action. It might provide a general description, but what if it omits a crucial detail or misinterprets the information? In medicine, where every piece of information matters, relying on a tool that cannot guarantee absolute accuracy is a risk we cannot overlook.

Promises and Realities of Personalized Learning

Many praise ChatGPT for its ability to adapt to individual needs. You can ask it to generate quizzes, summarize texts, or even create study plans. However, this personalization comes at a cost. By using a tool that fulfills your requests without questioning them, you risk limiting your ability to design your own learning strategies.

Medicine demands a proactive approach; over-reliance on artificial intelligence could lead you to adopt a passive role in your education, potentially hindering your development as critical thinkers and problem solvers.

"El impacto de la inteligencia artificial en la formación médica: ¿un aliado imprescindible o un riesgo para el pensamiento crítico y la ética profesional?

The Illusion of Knowing All the Answers

ChatGPT might seem like an endless well of knowledge, but it is not. Its database is limited to information available up to a certain point and cannot update itself with the latest medical advancements. This poses a significant problem in a field that evolves constantly. Blindly trusting its responses could perpetuate outdated or even incorrect information.

Furthermore, artificial intelligence lacks context and clinical judgment. It cannot differentiate between a reliable source and a questionable one, meaning you must act as critical filters to validate the information it provides. Are you prepared to take on that responsibility?

Technological Dependency and Ethics

Another aspect to consider is the impact of technological dependency on your professional development. If you become accustomed to relying on ChatGPT for every question, you may struggle to solve problems independently in situations where this technology is unavailable, such as in an operating room or during a remote consultation.
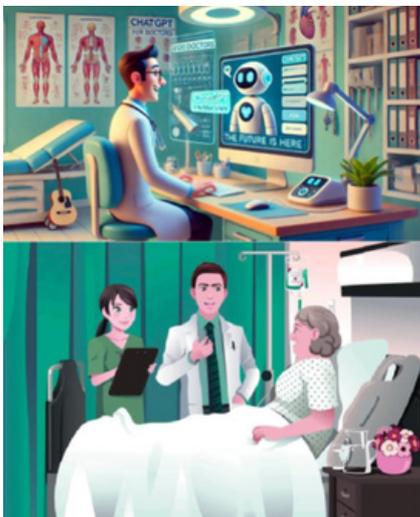
Additionally, the use of artificial intelligence raises ethical dilemmas. Is it appropriate to use ChatGPT to draft academic papers or prepare presentations without acknowledging its assistance? Integrity and transparency are fundamental values in medicine, and we must reflect on how the use of these tools affects our ethical responsibilities.

A Future with Balance

Do not misunderstand me—ChatGPT has tremendous potential. It can serve as a complementary tool to clarify doubts, explore complex topics, or practice clinical skills in simulated scenarios. However, the real challenge lies in using it judiciously, recognizing its strengths and limitations.

Future doctors, remember that artificial intelligence is a means, not an end. The foundation of your education must remain human learning, direct experience, and critical thinking. Use ChatGPT as an additional resource, but do not let it replace your curiosity, effort, or professional judgment.

Medicine is not just science; it is also art and humanity. No machine can replicate the connection you build with your patients or the satisfaction of solving a complex case on your own. At the end of the day, you are the future doctors the world needs—not only for what you know but for how you apply that knowledge with compassion and responsibility.

Does Using ChatGPT Make You a Worse Doctor?

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In the fast-paced field of healthcare, where knowledge evolves at an astonishing rate, students and professionals face a significant challenge: staying up-to-date with current information and applying it effectively in clinical settings. In this context, ChatGPT emerges as a revolutionary tool capable of complementing and enriching learning, research, and professional practice.

Potential in Health Sciences Education

Artificial Intelligence (AI) can serve as an omnipresent virtual tutor. Its ability to answer complex questions, generate summaries, and clearly explain concepts makes it an invaluable resource in the educational process. For instance, when tackling intricate topics such as the pathophysiology of diseases or pharmacological mechanisms, ChatGPT can break down information in an understandable way without sacrificing scientific rigor. Furthermore, its interactive nature fosters self-directed learning, a crucial skill in the medical field.

In addition to these capabilities, ChatGPT can assist students in preparing for examinations by generating practice questions, quizzes, and case studies tailored to their specific needs. It can also provide real-time feedback on assignments, essays, or research proposals, allowing students to refine their academic work and enhance their critical thinking skills. This ability to personalize the learning experience makes ChatGPT a versatile tool in medical education.

In clinical simulation, ChatGPT can complement practical scenarios by acting as a "virtual patient." By generating plausible responses to diagnostic or therapeutic questions, students can refine their communication and clinical reasoning skills. This not only enhances the educational validity of exercises but also provides a safe environment for making mistakes and learning from them. Additionally, ChatGPT can simulate various patient profiles, including those with rare diseases, thereby exposing students to a broader spectrum of clinical conditions.

Utility in professional practice

For healthcare professionals, ChatGPT represents a support tool that can optimize clinical decision- making. While it does not replace medical judgment, its ability to synthesize large volumes of information — such as clinical guidelines and scientific articles— allows for quick access to relevant data. This is particularly useful in high-pressure situations where time is a critical resource.

Beyond immediate clinical applications, ChatGPT can assist professionals in administrative tasks, such as drafting patient reports, summarizing medical records, or preparing presentations for conferences. Its capacity to process and organize data efficiently can save valuable time, allowing healthcare providers to focus more on patient care.

Another significant application is the generation of educational materials for patients. ChatGPT can draft clear and accessible explanations about diagnoses, procedures, and recommendations tailored to different levels of health literacy. This empowers patients by providing them with comprehensible information, thereby fostering informed and collaborative decision-making. Moreover, it can facilitate communication between healthcare providers and multilingual patients by offering translations or culturally sensitive explanations.

Ethical considerations and limitations

While AIś potential is formidable, it is also imperative to consider its limitations. The tool should not be seen as a substitute for expert knowledge but as a complement. Additionally, verifying the information it provides is crucial, as language models can generate incorrect or outdated responses. Regarding privacy, the use of ChatGPT must comply with ethical and legal regulations, particularly those concerning the protection of sensitive data. The responsible implementation of this technology in clinical and educational settings is essential to

ensure its acceptance and effectiveness. Institutions adopting ChatGPT should establish clear guidelines and protocols to safeguard patient confidentiality and data security.

Beyond technical challenges, ethical dilemmas also emerge. Is it appropriate to rely on artificial intelligence for critical tasks? How can we ensure that the information is always impartial and accurate? These questions invite ongoing reflection on the role of AI in medicine and education, aiming to use it equitably and responsibly.

The potential for bias in AI-generated content is another significant concern. Developers and users must work collaboratively to identify and mitigate biases in data training models like ChatGPT. Transparency in AI decision-making processes is essential to build trust and ensure ethical practices in healthcare.

A look to the future

The advent of tools like ChatGPT signals a new era in health education and practice. When integrated prudently and thoughtfully, these technologies can revolutionize how we learn and apply medical knowledge. Both students and professionals have a tool that, when used discerningly, can catalyze progress toward more effective and equitable healthcare.

Looking ahead, the role of AI in healthcare is expected to expand further. Innovations like integrating ChatGPT with wearable devices or electronic health records could provide real-time insights and personalized recommendations, enhancing patient outcomes. Collaborative efforts between technologists and healthcare professionals will be essential to ensure these advancements are implemented effectively and ethically.

In a world where knowledge is power, having AI as an ally is undoubtedly a bold step toward excellence. But think about it—can you believe everything you read?

Believe nothing you hear, and only half of what you see...

Artificial intelligence is a tool. The choice on how it is used is up to us.

Evolution of hearing aid devices and new prospects

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Hearing enables communication, listening, and understanding of our surroundings. This sense is essential for social interaction and good performance in several day-to-day activities, whereby is essential for a good quality of life.

In 2024, the World Health Organization made a statement reporting that more than 5% of the world's population -approximately 430 million people- experience significantly loss of hearing that requires rehabilitation, including 34 million children. By 2050, this number is expected to exceed 700 million people, equating to one in ten people. This highlights the importance of addressing hearing loss, as many causes are preventable. This article focuses on the relevance of hearing aid devices.

The design and manufacture of hearing aid devices align with the specific pathologies, available resources, public health strategies, and technological advancements. In today's world, where should the hearing aid devices industries direct their efforts? What therapeutic directions still need to be explored? To answer these questions, we must examine the history of hearing aid devices over the decades to understand their evolution and propose a way forward for improved outcomes.

According to the audiologist Juan Carlos Olmo Cordero, "The history of hearing devices must be divided into five eras: the acoustic, the coal, the bulb, the transistor, and the digital era." (2) He classifies these periods based on the technology used in hearing devices, which have evolved from rudimentary instruments like ear trumpets to sophisticated electronic devices. Initially, hearing aids were large and highly visible, primarily designed to amplify sound reaching the external ear. Over time, they became more compact design allowing for placement in the external auditory canal, thereby improving functionality and expanding the potential user base. Recently, more invasive yet effective options have been developed.

In the journal "Cirugía Otorrinolaringológica y Cervicofacial", Doctor E. Truy published an article discussing invasive prostheses available including cochlear implants, auditory brainstem implants, auditory osseointegrated implants, and middle ear implants (3). Cochlear implants consist of two components: an external sound processor and an internal implant. The external vocal processor captures sound via a microphone, processes it, and converts it into electrical signals.

The surgically placed implant component receives these signals through an antenna and contains electrodes that stimulate the auditory nerve. While cochlear implants do not restore normal hearing, however, they enable people with severe hearing loss to perceive sounds and understand speech. Auditory brainstem implants function similarly but stimulate the cochlear nucleus in the brainstem rather than the cochlea.

They were originally developed for cases involving auditory nerve tumors or conditions that made cochlear implantation unviable due to damage in auditory nerves. Auditory osseointegrated implants transmit sound vibrations directly to the cranial bone, which is then passed to the internal ear bypassing the external and middle ear, making them useful in cases of conductive hearing loss and unilateral hearing loss. Middle ear implants, like the other devices mentioned, are permanently placed with a surgical procedure.

The evolution of hearing aid devices reflects not only technological advances but also a commitment to enhancing the quality of life for those with hearing loss. From acoustic ear trumpets to complex cochlear implants, each development era has responded to the changing needs of the patients and the technical challenges of the time. However, innovation in design and functionality alone is insufficient, ensuring accessibility and providing support throughout the adaptation process and emotional backing for users and families, is equally crucial.

As the number of individuals experiencing hearing loss continues to rise, the future of these hearing-aid devices depends not only on technological innovations but also a holistic approach that encompasses education, public health, and equitable distribution. Only through this comprehensive approach can we fulfill the true purpose of these instruments: to help people restore their ability to communicate and engage with the world around them.

# Physician and Machine: a brief view to the near future of AI in medicine

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From the last technological developments, artificial intelligence progress (AI) has surpassed being a futurist concept to become a tangible reality as today, the models based on these technologies and their massive adoption in large corporations have not only enabled an enormous simplification in a great number of tasks but has also contributed to open a recurring discussion. As AI becomes more relevant in our lives, the discussions and speculations on the possible repercussions intensify primarily in the work environment, which leads to the question: can AI replace the job of a human being? The short answer is yes. It is undeniable that this advancement implies changes, as it has occurred before all the tech we use. (1)

However, the AI case seems different because we discuss a complex phenomenon, which with the current scope is difficult to estimate and an intrinsic nature that constantly challenges the boundaries we consider human-exclusive. (3)

In this context, the medical professionals who were considered a "secure environment" against automatization, have neither been exempted from new tendencies since AI-based technologies incorporation is visible in a diversity of areas, such as data analysis, imaging diagnosis, or even clinical research. (2). This is reflected in the vast number of published articles that include terms such as "Artificial intelligence" or "AI" in databases like PubMed or Scopus, which demonstrated the recent popularity of the topic in the medical community.
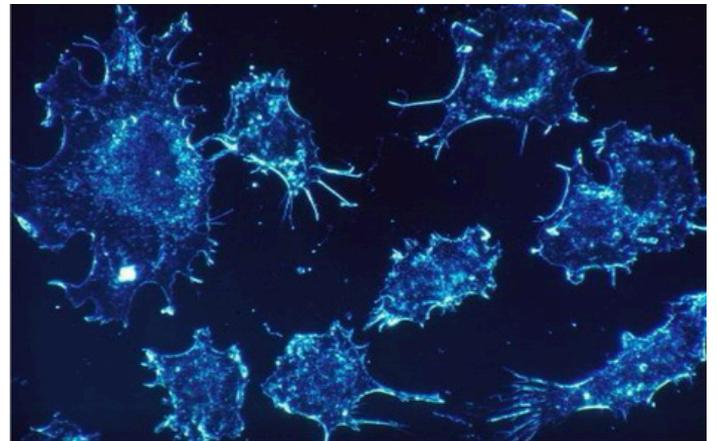
All of the above raises as future healthcare professionals an unavoidable question: perhaps, are we encountering the next tool for medical press or a potential risk that must be carefully managed? The answer as in many other technology advancements is not simple. AI implementation in medicine offers great opportunities to progress in this discipline like precise diagnosis, optimized time response, and effective personalized treatment according to patient needs. (4) However, simplifying it as a series of benefits would streamline a much more complex reality. Technology dependency in the delicate health field presents challenges beyond operative efficiency. For instance, one of the main risks discussed is dehumanization in medical care. (5,6)

Empathy, intuition and the capacity to interpret emotions are important factors in this interaction, and nowadays any technology could become the same as these human qualities. On the other hand, the presence of a bias is another fundamental aspect to consider. As we should remember, AI works around algorithms that process infinite amounts of information that exists in the world to give us answers, therefore their efficacy depends directly on the quality and diversity of information that can be obtained in the short time it works. The AIs do not possess either conscience and intention; any partiality that could manifest are essentially a reflection of the human prejudices in the developers that programated their design and uses. (7)

In this way, the AI implementation in the medicine field, as we would expect, came with it a couple of ethical and legal aspects, which must be considered before the usage. How would we be sure about the personal data privacy which are used for training these models? Who will be responsible when in the future a decision that will be taken by an AI becomes a medical mistake? These questions must not be ignored and the answers, such as experts suggest, may require a legal framework. (8)

Nevertheless, it is evident we must not reject all the positive aspects of the technology advances only for the fear of the consequences, there is where the main challenge exist: find the balance between taking advantage of the AI and moderate the risks, which requires public policy, professional training and a technological ethic that priorities the human well being.

Ultimately, we need to realize that technological advancements are inevitable, nevertheless, we must remember that the direction and the possible effects depend on the usage, because it is not an autonomous identity; it is a human creation, and should be oriented with principles that reflect our values and aspirations. The AI can process information in the least amount of time, identify patterns that the human eye could let out and optimize clinical hardwork. Nonetheless it lacks empathy, intuition, and the capacity to contextualize, in comparison with the human being. Following that, the AI integration in the medical praxis requires reflection and be critical, in the development and usage, because of that, the future of the medicine is not in deciding if the AI will substitute the medical professionals or not, but in being sure that the physicians use it prudently.
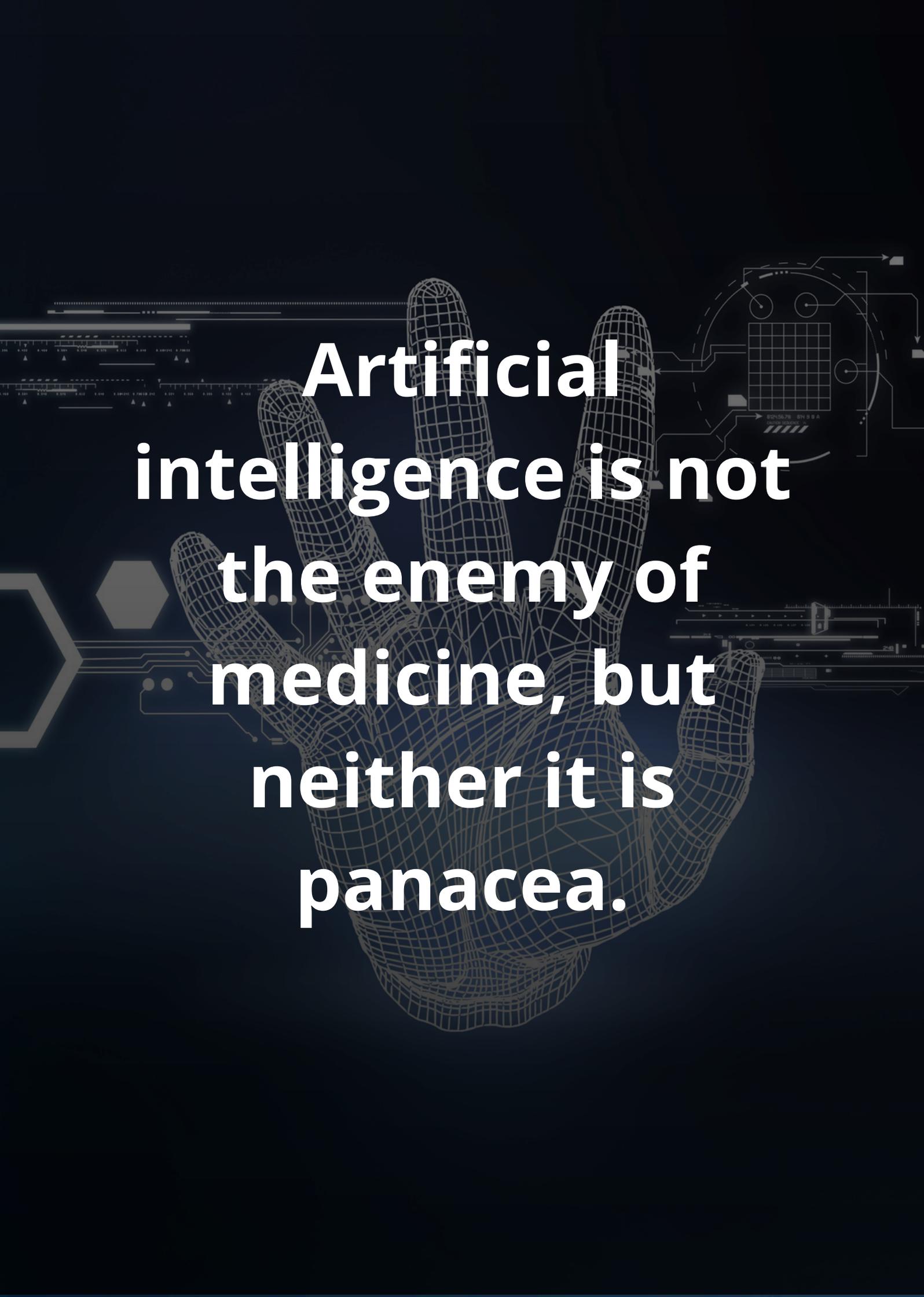
Artificial intelligence is not the enemy of medicine, but neither it is panacea.

The Revolution of Artificial Intelligence in Medicine: Opportunities and Challenges

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Artificial intelligence (AI) in medicine refers to the use of machine learning models to process medical data and provide valuable information to physicians, ultimately enhancing health outcomes and patient experiences. (1) It has become an essential tool for optimizing medical care and research, aiding in the development of new therapies and improving the efficiency of the healthcare system. (2)

AI is increasingly being integrated into medical research, with applications including clinical data analysis, medical image processing, and the creation of smart health-monitoring devices. Current trends indicate a significant rise in investment in AI, particularly aimed at improving the prevention and treatment of chronic diseases.(3)

Artificial Intelligence in Research

In the context of clinical trials, AI can automate and optimize several stages of the process, such as trial design, patient eligibility identification, image interpretation, and data analysis. This can enhance efficiency and lower costs. However, it is essential to incorporate AI cautiously and transparently to safeguard the validity of trial results, as there are technical and ethical challenges to consider, including data privacy and selection bias.(4-7)

Additionally, in the preparation of scientific papers, AI can automate tasks like literature reviews and draft generation, which increases efficiency and reduces the time required for publication. Nevertheless, significant limitations exist, such as the tendency of AI models to "hallucinate" or produce false information, and their reliance on non-peer-reviewed data, which raises ethical and legal concerns. (8)

In statistical data analysis, AI offers considerable benefits by enabling the management of large volumes of data and identifying complex patterns that may elude traditional methods. These capabilities are particularly valuable in clinical trials, where AI could enhance patient selection and stratification, thereby improving trial outcomes. In cancer research, AI plays a crucial role in diagnosis, prognosis, and treatment personalization, leading to improved precision and equity in patient care. There are significant limitations associated with AI models, such as their tendency to "hallucinate" or produce false information, as well as their reliance on non-peer-reviewed data, which raises ethical and legal concerns. (8)

In statistical data analysis (Image 1), AI offers considerable advantages by managing large volumes of data and identifying complex patterns that traditional methods may overlook. These capabilities are particularly valuable in clinical trials, where AI can enhance the selection and stratification of patient populations, thereby improving trial outcomes. (9) Moreover, in cancer research, AI assists in diagnosis, prognosis, and the personalization of treatment, ultimately enhancing precision and equity in healthcare delivery. (10, 11)

Artificial Intelligence in Medical Care

In the field of personalized medical care (Image 2), AI has transformed the methods of compiling and analyzing physiological data, allowing for the automation of current medical tasks, increased access to healthcare, and improved overall performance in medical services. (12) Additionally, AI is being employed to enhance the quality of medical care through the use of portable monitoring devices, predictive analytics models, and automated citation systems. However, it continues to face significant challenges related to data security, algorithmic bias, and patient acceptance. (6, 11)

In cancer research, AI and machine learning are utilized to detect and diagnose cancer, classify subtypes, optimize treatments, and identify new therapeutic targets. To fully harness AI's potential in this area, it is crucial to address design bias and ensure proper algorithm implementation to prevent exacerbating health disparities. (7, 10, 11, 13)

At a global scale, artificial intelligence (AI) has been explored to address unique challenges in global health, particularly in low- and middle-income countries. AI can be utilized for diagnosis, risk analysis regarding morbidity and mortality, disease outbreak tracking, and health policy planning. (14) However, significant challenges related to data security and ethics remain, which need to be addressed to ensure fair and secure AI applications.(10,15) Despite its potential, there are issues surrounding data quality, patient privacy, and the availability of adequate technological infrastructure.
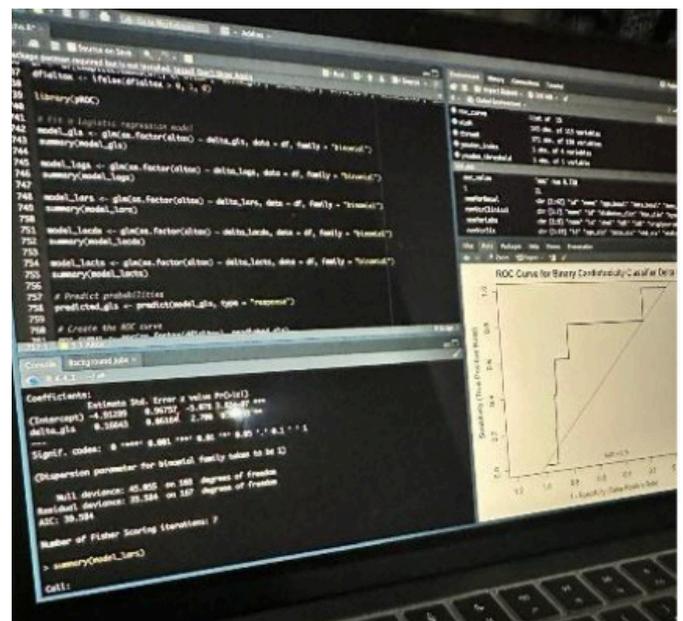
Challenges in the Use of Artificial Intelligence

The implementation of AI in healthcare faces several pertinent challenges, particularly data privacy and algorithmic bias. These issues can limit the applicability and security of AI toolkits in real clinical settings.(16) Algorithmic bias in healthcare can disproportionately affect certain demographic groups, exacerbating existing disparities in medical care. The medical literature identifies the most vulnerable groups as:

1. Racial and Ethnic Minorities

Health algorithms often exhibit significant bias against Afro-descendant patients and other ethnic minorities. For instance, one study found that a widely used algorithm underestimated the severity of conditions in Afro-descendant patients compared to Caucasians, as it was based on medical care costs rather than actual disease severity. This resulted in less resource allocation for Afro-descendant patients. Additionally, medical devices such as pulse oximeters have demonstrated inaccuracies in their measurements, potentially leading to inadequate treatment. (17,18)

2. Patients with Low Socioeconomic Status

Algorithms may also show bias against patients from low-income backgrounds. Predictive models for hospital readmissions have reported a high false-positive rate among low-income populations, reflecting disparities in access to medical attention and care. (19)

3. Women

In cardiology, heart disease predictive algorithms have been found to underdiagnose women, resulting in a higher false-negative rate compared to men. This can be attributed to the overrepresentation of men in the datasets used to develop these models. (20)

4. Underserved Populations

AI algorithms applied to medical imaging, such as thoracic X-rays, have shown a bias that leads to underdiagnosis in historically underserved populations, including Hispanic and Afro-descendant patients. This contributes to delays in accessing appropriate treatment. (21)

These findings underscore the necessity of evaluating and mitigating algorithmic bias in healthcare models to promote equity and prevent the perpetuation of existing disparities. To address these challenges, it is crucial to develop ethical guidelines and regulatory policies that ensure technology remains impartial and bolster patient trust. (6, 14)

In summary, artificial intelligence is transforming the production and analysis of scientific articles, enhancing both efficiency and research quality. However, it is essential to engage with the ethical and technical challenges involved, such as data quality and transparency in automated tasks.

We call upon researchers, editors, and scholars to adopt a proactive stance regarding AI in the creation of scientific articles. This includes establishing clear standards for AI tool usage, ensuring rigorous review of generated data, and fostering interdisciplinary collaboration to mitigate bias and improve the validity of results. By doing so, we can maximize the potential of artificial intelligence in scientific research, ensuring that progress is precise, ethical, and accessible to the entire scientific community.

Dedication:
To Hiram and Hassler, my dearest friends:
I want to express my deepest gratitude for your invaluable support and trust. Without you, this accomplishment would not have been possible. Thank you for believing in me, even during uncertain times. Your friendship has been my anchor, my shelter, and my greatest strength.

I cherish the laughter, debates, and the quiet moments we've shared together. Every word of encouragement and every gesture of kindness have resonated in my heart, motivating me to pursue new goals. Your friendship is like a thick, leafy tree that provides me with shade, protection, and fruit at every stage of this journey.

I dedicate this paper to you as a small gesture of appreciation for being my chosen family. As Antoine de Saint-Exupéry said, "A friend knows you as you are, understands where you have been, accepts what you have become, and still gently allows you to grow."
Thank you for everything. I love you both,
Lenyn

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SOYAMMEF

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