

*Editorial*

## Teaching, research, development, and innovation in the health field

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The health sector is facing increasingly complex challenges, and access to high-quality, evidence-based information is essential for promoting healthy longevity. The major challenges to be addressed are: (i) population ageing, (ii) an increase in chronic diseases, (iii) inequalities in access to healthcare services and (iv) the rapid evolution of technology. In this context, collaboration between teaching, research, development and innovation is crucial for improving health systems, encompassing both prevention initiatives and treatment protocols. Therefore, effective, safe and evidence-based care must be promoted.

Health education is responsible for training professionals, at different qualification levels who can think critically, act ethically, and work across disciplines. Curricula that align with clinical practice, scientific reasoning and continuing education facilitate the adoption of new technologies, protocols, and therapeutic and preventive approaches. Integrating teaching and research from an early stage strengthens evidence-based clinical decision-making, thereby contributing both to both the quality of care and the advancement of scientific knowledge in basic and clinical research.

Scientific research in health provides the basis for understanding pathophysiological mechanisms, developing and improving diagnostic methods, and evaluating the efficacy and safety of therapeutic interventions whether pharmacological or non-pharmacological.

Translational research accelerates the incorporation of scientific knowledge into health services by bringing the laboratory findings closer to clinical practice and helping to bridge the gap between findings and application. Against this backdrop, the *Brazilian Journal of Mechanical Vibrations in Biosciences* (BJMVB) aims to publish original scientific research and disseminate the full potential of mechanical vibrations generated by different devices in health-related contexts. This focus is reflected in the articles published in the current issue of BJMVB, as well as in previous editions available in the journal's website.

Technological development enables research findings to be transformed into devices, protocols and therapeutic and preventive methods, which can be applied to digital healthcare proposals, whether or not they use artificial intelligence. This process involves clinical validation, standardization, evaluation of cost-effectiveness, and adaptation to the healthcare systems available in each country. Technological development improves the efficiency of services, optimizes resources, and increases the quality of care for the population.

Innovation in healthcare emerges from the integration of scientific knowledge, clinical requirements, and technological advancements. Examples of innovation include new devices for use in the medical field, inputs for more targeted therapies, protocols for preventing disease and accident, care models, prevention strategies and digital tools. Omics-based approaches have contributed significantly to personalized medicine and improved clinical outcomes. According to the Organization for Economic Co-operation and Development (OECD), innovation in healthcare is crucial for the sustainability of healthcare systems, as it promotes solutions that increase access, improve clinical outcomes and reduce long-term costs.

Integrating teaching, research, development and innovation strengthens scientific progress and improve the way health systems respond to challenges. It also promotes the training of better prepared professionals, stimulates relevant scientific production and favors the transfer of technology and knowledge.

Thus, teaching, research, development and innovation in the field of health are consolidated as essential axes for scientific advancement, improving quality of life and achieving sustainable development in this field. In this context, the 2023 Joint Congress on Mechanical Vibrations and Technological Innovations in Health (MEVITIH) was established to encourage the participation of professionals, researchers, health managers, and students promoting evidence-based clinical practice and sustainable health management, as well as fostering and strengthening scientific collaborations.

This issue of BJMVB also contains abstracts of the posters at MEVITIH-2025. All researchers and students reading this issue are welcome to explore the importance of aligning and advancing teaching, research, development and innovation in the field of health in a sustainable way.

## References

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