EDITORIAL

New evidence-based practice: Artificial intelligence as a barrier breaker

Ricardo Maia Ferreira

Ricardo Maia Ferreira, Department of Sports and Exercise, Polytechnic Institute of Maia (N2i), Maia 4475-690, Porto, Portugal

Ricardo Maia Ferreira, Department of Physiotherapy, Polytechnic Institute of Coimbra, Coimbra Health School, Coimbra 3046-854, Coimbra, Portugal

Ricardo Maia Ferreira, Department of Physiotherapy, Polytechnic Institute of Castelo Branco, Dr. Lopes Dias Health School, Castelo Branco 6000-767, Castelo Branco, Portugal

Ricardo Maia Ferreira, Sport Physical Activity and Health Research & Innovation Center, Polytechnic Institute of Viana do Castelo, Melgaço, 4960-320, Viana do Castelo, Portugal

Corresponding author: Ricardo Maia Ferreira, PhD, Professor, Sports and Exercise Department (N2i), Polytechnic Institute of Maia, Avenida Carlos de Oliveira Campos, Maia 4475-690, Porto, Portugal. rferreira@ipmaia.pt

Abstract

The concept of evidence-based practice has persisted over several years and remains a cornerstone in clinical practice, representing the gold standard for optimal patient care. However, despite widespread recognition of its significance, practical application faces various challenges and barriers, including a lack of skills in interpreting studies, limited resources, time constraints, linguistic competencies, and more. Recently, we have witnessed the emergence of a ground-breaking technological revolution known as artificial intelligence. Although artificial intelligence has become increasingly integrated into our daily lives, some reluctance persists among certain segments of the public. This article explores the potential of artificial intelligence as a solution to some of the main barriers encountered in the application of evidence-based practice. It highlights how artificial intelligence can assist in staying updated with the latest evidence, enhancing clinical decision-making, addressing patient misinformation, and mitigating time constraints in clinical practice. The integration of artificial intelligence into evidence-based practice has the potential to revolutionize healthcare, leading to more precise diagnoses, personalized treatment plans, and improved doctor-patient interactions. This proposed synergy between evidence-based practice and artificial intelligence may necessitate adjustments to its core concept, heralding a new era in healthcare.

Key Words: Evidence; Clinicians; Patients; Artificial intelligence; Evidence-based practice

Core Tip: Evidence-based practice principles remain crucial in clinical care. However, practical application faces challenges. The recent emergence of artificial intelligence offers solutions for the main barriers. Artificial intelligence can swiftly provide evidence, enhances clinical decision-making, combat patient misinformation, and improve clinical consultations. The integration of artificial intelligence into evidence-based practice represents a potential paradigm shift, requiring some adjustments to the core concept of evidence-based practice.

INTRODUCTION

The evidence-based practice (EBP) principles are several years old[1], yet their importance remains as relevant as ever. EBP continues to be considered the gold standard for the best clinical practice[2]. As it was developed some years ago, it has undergone some changes (*e.g.*, evidence-informed practice), but its foundation principles persist, with the best evidence, clinical expertise, and patient preferences playing central roles[3]. However, despite the widespread acknowledgment of its importance in the daily clinical practice, its practical application can be challenging and some barriers to its implementation arise. Some of these barriers include[4]: Lack of skills to understand studies; insufficient resources and funding; time constraints; lack of informatics and linguistic competencies; overtasking, heavy workload and competing priorities; inadequate training and stakeholders support; patient personal characteristics and health illiteracy; lack of motivation, confidence, interest, and commitment to change; evidence "unrealistic", inaccessible, "unreadable", conflicting, and massive.

While the concept is not new[5-9], we have only recently witnessed the emergence, interest, and adoption of a new technological revolution known as artificial intelligence (AI)[5,10]. AI encompasses the creation of machine learning technology, capable of performing high-level executive functions that typically require human intelligence (such as reasoning, learning, planning, and creativity)[7,11-17]. We observe applications in techs (*e.g.*, smart cars, smart homes, smartphones, computers, robots, and drones), navigation systems, code writing, facial recognition, chatbots, image and data analysis, translators, audio output, and more[11-13,18-23]. Like any other technological tool, AI has incrementally become a part of our lives, despite the reluctance of some public[13,16,24,25]. The AI use brings both advantages and disadvantages. Its advantages and disadvantages are summarized in (Table 1)[7,14,24,26-35].

By understanding and carefully evaluating its pros and cons, AI could be considered as a potential solution for overcoming some of the main barriers encountered in the application and implementation of EBP. Here are some examples: (1) Inability to stay updated with the best evidence. As it may be known, the pace of scientific production is currently at its peak. The number of articles is growing exponentially[36], making it nearly humanly impossible to search for and read all the information published every day. AI can assist in the search process by summarizing the latest literature within seconds, thus saving clinicians time for other tasks[24,26,31,37-39]. However, as it currently stands, AI still has some "bugs" (known as *AI Hallucinations*) and is not yet able to critically analyze it[12,13,21,34,37,39-51], making it essential that the clinician continues to do their own "homework"[51,52]. In addition, there is another evidence-related barrier – comprehension. Studies often employ a specialized scientific language, with English as the predominant language[53,54]. Many clinicians still do not have a satisfactory scientific and linguistic understanding to stay updated [55]. AI is already capable of providing definitions, complete document translations, (re)writing, and summarizing[13,18, 21,22,25,37,39,54,56-61], overcoming this barrier; (2) Enhanced clinical decision-making. During a clinical session, it is up to the clinician to assess the patient's clinical situation and, based on the results, present the best intervention plan to their patients, considering the best and most recent literature along with their clinical experience[62]. Therefore, the first phase of clinical reasoning heavily relies on the clinician's "isolated" judgment. AI has already evolved to the point where it can integrate information from imaging and clinical findings, typical disease progression patterns, treatment responses (risk and benefits), and scientific information[7,8,12,16,23,24,35,38,39,57,63-70]. Consequently, AI can act as a second clinician in the decision-making process, where the human clinical expert can interact with the "artificial clinical expert", leading to more accurate decisions and presenting more precise diagnoses, prognoses, and personalized/tailored interventions plans for their patients[6,14,16,23,52,57,65,69-73]. This human-machine interaction may be particularly valuable for those just starting out their careers. As explored, one of the foundations for better clinical decision-making involves clinical experience. However, those who are just starting out in the profession do not yet have enough clinical experience to be experts in the field, and often have to make the first stage of the decision solely based on scientific evidence[74]. Therefore, AI could act as the expert in this situation, helping novice clinicians with their clinical decision-making; (3) Patient misinformation. While patients often do not actively participate in clinical decision-making, their beliefs and preferences should, in accordance with the principles of EBP, be considered when devising an intervention plan[1]. In this way, there is a mutual partnership between the clinician and the patient, as their beliefs and preferences can help

Table 1 Example of artificial intelligence advantages and disadvantages

Advantages	Disadvantages
Efficiency	Job displacement
Accuracy	Bias
Cost reduction	Lack of empathy
Constant availability	Complexity
Data analysis	Security risks
Customization	Lack of transparency
Scalability	Fairness
Natural language processing	Regulation
Automation	Ethical concerns
Productivity	
Accessibility	
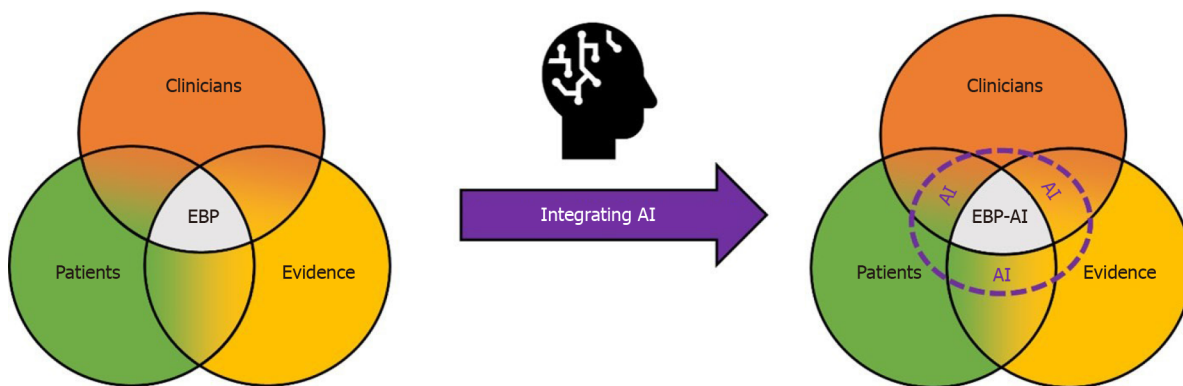
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Figure 1 Evidence-based practice artificial intelligence. EBP: Evidence-based practice; AI: Artificial intelligence.

(positively) limit the number of possible interventions/therapies/treatments, making a treatment plan easier to adhere [75]. However, patients' beliefs and preferences can sometimes pose a barrier. Patients frequently arrive at clinical appointments misinformed about their clinical condition and some of the interventions/therapies/treatments[76]. AI, if less biased[34,40], could correctly provide information to patients about their clinical condition and the most appropriate interventions/therapies/treatments[14,71,77]. This will greatly facilitate the doctor-patient interaction, thus enhancing the quality of intervention planning and clinical management[71,77]; and (4) Time constraints in clinical practice and consultations. As is well known, many clinicians spend a substantial amount of time on bureaucratic and administrative tasks, leaving them with insufficient time for proper patient care[7,38,75]. AI can assist in scheduling, triage, filling out forms, billing, monitoring, and responding to routine tasks (almost like an artificial assistant or secretary)[7,28,38,69,73, 78]. This would allow clinicians to free up more time for tasks that involve essential human interaction, simply by issuing a few basic and quick commands[31,38,52].

CONCLUSION

As explored, AI can be considered a useful tool in clinical management, encompassing various aspects such as time management, assessment, interaction, prescription, monitoring, decision-making, information processing, and more. This could potentially usher in a paradigm-shift in EBP, requiring minor adjustments to its core concept. Consequently, the new EBP-AI proposal is presented in (Figure 1).

FOOTNOTES

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