




The Need for More Attention to the Validity and Reliability of AI-Generated Exercise Programs

Seyed Milad. Saadati^{1*} 

¹ Department of Laboratory Medicine and Pathobiology (LMP), University of Toronto, Canada

* Corresponding author email address: m.saadati@mail.utoronto.ca

Article Info

Article type:

Commentary Article

How to cite this article:

Parsakia, K. (2023). The Need for More Attention to The Validity and Reliability of AI-Generated Exercise Programs. *Health Nexus*, 1(1), 77-81.



© 2023 the authors. Published by KMAN Publication Inc. (KMANPUB), Ontario, Canada. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

ABSTRACT

In the evolving realm of health and fitness, the integration of artificial intelligence (AI), especially tools like ChatGPT in creating exercise programs, represents a significant technological leap. This paper addresses the critical need for thorough examination of the validity and reliability of such AI-generated exercise regimens. We explore the dual facets of opportunity and challenge presented by AI in fitness, emphasizing the importance of aligning AI recommendations with established exercise science principles and individual health requirements. The paper advocates for a systematic framework to assess these programs and discusses the potential risks and benefits. Ultimately, it seeks to bridge the gap between technological innovation and health safety, promoting responsible utilization of AI to enhance physical well-being. This discussion contributes to the ongoing dialogue about AI's role in health and fitness, underscoring the need for a balanced approach that prioritizes both innovation and safety.

Keywords: Chatbots, reliability, validity, AI, exercise programs

1. Introduction

In the rapidly evolving landscape of fitness and health, the integration of artificial intelligence, exemplified by tools like ChatGPT, in devising exercise training and programs marks a significant technological advancement (1). However, this innovation raises pertinent questions about the validity and reliability of such AI-generated exercise regimes (2). This paper aims to underscore the necessity of a thorough examination of these aspects, ensuring that these AI-based recommendations align with established exercise science principles and cater to individual health needs effectively.

The advent of AI in fitness presents both opportunities and challenges. On one hand, it offers personalized, accessible, and diverse training options, potentially revolutionizing how individuals approach physical fitness. On the other hand, the automated nature of these recommendations necessitates a critical evaluation to ascertain their safety, efficacy, and alignment with professional standards (3). The purpose of this commentary is to highlight the importance of such evaluations and to propose a framework for systematically assessing the validity and reliability of exercise programs generated by AI tools like chatbots. Through this discourse, we aim to bridge the gap between technological innovation and health

safety, fostering an environment where AI can be harnessed responsibly to enhance physical well-being. This paper will delve into the necessity of evaluating AI-devised exercise plans, discuss the potential risks and benefits, and suggest methodologies for ensuring that these digital fitness solutions are both scientifically sound and user-centric. In doing so, it seeks to contribute to the ongoing conversation about the role of AI in health and fitness, advocating for a balanced approach that prioritizes both innovation and safety.

2. Literature review

A study from China highlights the significant progress and results achieved by integrating AI technology in sports education and physical fitness evaluation. This integration has enhanced the quality of life by providing high-quality, customized, and personalized health management services. The study emphasizes the formulation of personalized and intelligent exercise programs based on deep learning models, which have shown effectiveness in evaluating physical fitness and providing exercise guidance (4).

A randomized controlled trial compared a commercialized AI mobile application with a physical therapist in evaluating and improving bodyweight squat form. The study found that the AI application had satisfactory ability to identify correct squat form but limited ability to identify incorrect form. This limitation in diagnostic capabilities suggests the need for further improvement in AI technology for fitness training. The study also noted the importance of AI's real-time audiovisual feedback and its effectiveness in treating lower back pain (5).

Another study by Matsuo et al. (2021), conducted during the COVID-19 pandemic, focused on evaluating the effects of an online exercise training program on physical fitness and health-related variables in Brazilian older adults. This study demonstrates the feasibility and positive effects of an online exercise training program for older adults during the COVID-19 pandemic. It highlights the potential of digital platforms in delivering effective physical activity interventions, especially in challenging times like a global health crisis (6).

Moreover, Thomas et al.'s (2020) study proposes a tool for assessing the quality of exercise therapy programs in randomized clinical trials (RCTs). The study proposed the i-CONTENT tool for assessing the quality of exercise therapy programs in RCTs. The i-CONTENT tool consists

of seven items: patient selection, qualified supervisor, type and timing of outcome assessment, dosage parameters, type of exercise, safety of the exercise program, and adherence to the program. This tool aims to provide a transparent assessment of the quality of exercise therapy programs (7).

Research on AI applications in sports training indicates that AI can provide specific support in physical education through data analysis and simulation of training scenarios. However, the research is still in its early stages, and there is a lack of systematic investigation into the integrated application of AI in physical education training. Research highlights the potential of AI to facilitate physical training through various technological advancements like wearable smart sports products, motion capture technology, visual target tracking systems, and virtual reality sports simulation systems. These technologies allow for detailed data collection and analysis, which can enhance the training efficiency and performance of athletes (5, 8).

Finally, as Peluso (2015) discusses the risks associated with overemphasis on exercise and diet, potentially leading to eating disorders and overtraining syndrome (9). It highlights the importance of a balanced approach to physical activity, which AI-generated programs might fail to consider. Moreover, Rhon et al.'s (2014) study compares the effectiveness of corticosteroid injections versus manual physical therapy in treating shoulder impingement syndrome (5). It underscores the complexity of physical therapy and the potential limitations of AI in addressing specific medical conditions.

3. Discussion

This article emphasizes the growing significance of AI in developing exercise programs, highlighting both the potential and the challenges. While AI applications in fitness training show promising advancements, particularly in personalization and efficiency, concerns remain regarding their diagnostic accuracy, especially in identifying incorrect forms or movements. The integration of AI with technologies like wearable devices, motion capture, and virtual reality is innovative, yet it demands continuous refinement and rigorous evaluation. The studies reviewed in this article collectively underscore the necessity for a balanced approach in AI-generated exercise programs. They should not only focus on physical training but also consider the psychological and medical aspects of health and fitness. The risks associated with overemphasis on exercise, as well as the limitations of AI in addressing

specific medical conditions (10), highlight the importance of human oversight in AI-generated fitness recommendations. Moreover, the need for reliable tools, for assessing and refining these AI-driven interventions is critical to ensure their quality and efficacy. Ultimately, while AI can significantly contribute to the field of physical fitness and rehabilitation, it is imperative to maintain a judicious blend of technological innovation and traditional, personalized health care approaches.

While AI technologies in sports training and exercise programs show promising results, particularly in providing personalized and efficient training, their diagnostic capabilities, particularly in identifying incorrect forms or movements, need further development. The integration of AI with wearable technology, visual tracking systems, and virtual reality offers innovative approaches for enhancing athletic training and physical fitness programs. However, further research and systematic evaluation are necessary to fully understand and harness the potential of AI in this field.

4. Conclusion

The critical analysis presented in this article sheds light on the necessity of scrutinizing the validity and reliability of AI-generated exercise programs. While AI has demonstrated substantial progress in enhancing physical fitness and sports training, the current research underscores a crucial need for meticulous evaluation and refinement of these technologies. The integration of AI in fitness training is indeed a transformative step; however, it brings forth challenges such as ensuring accurate diagnosis and adapting to the nuanced requirements of individualized therapy. This article emphasizes the importance of tools in assessing the quality of exercise therapy programs, highlighting the need for a systematic approach in validating AI-generated exercise recommendations. Additionally, the paper brings attention to the risks associated with an overemphasis on exercise, advocating for a balanced approach that integrates AI with human expertise in health and fitness domains.

The exploration of AI-generated exercise programs reveals a landscape where technological innovation intersects with health and fitness. While AI offers remarkable potential in personalizing exercise routines and enhancing fitness training, this article highlights critical areas that necessitate careful attention. The precision and accuracy of AI recommendations, particularly in

recognizing and adapting to the varied and dynamic needs of individuals, remain a primary concern. The integration of AI in this domain should not only focus on technological prowess but also on its alignment with established health and fitness standards.

Furthermore, the discussion emphasizes the importance of multidisciplinary collaboration. The involvement of healthcare professionals, fitness experts, and AI developers is crucial to ensure that AI-generated programs are not only technologically sound but also medically appropriate and beneficial. This collaborative approach can foster the development of AI solutions that are holistic, considering not just physical fitness but also the overall well-being of the users.

The potential risks associated with an overreliance on technology for health and fitness interventions are also a critical aspect of this discussion. The article advocates for maintaining a balance between automated AI-driven programs and human expertise, ensuring that AI supplements rather than replaces the personalized care and judgment provided by health professionals. This balance is vital for addressing complex health conditions and for providing exercise programs that are safe, effective, and tailored to individual needs.

In conclusion, this article underscores that while AI-generated exercise programs offer promising benefits in terms of personalization and efficiency, they require rigorous scrutiny to ensure their validity and reliability. These programs must be evaluated for their ability to cater to specific medical conditions and the complexities of individualized therapy. The paper advocates for a harmonious blend of AI innovation and traditional health care approaches, ensuring that AI-generated exercise programs are not only technologically advanced but also safe, effective, and aligned with professional health standards. As AI continues to evolve and integrate into various sectors, including health and fitness, it is imperative that its applications are critically examined and continuously improved for the betterment of public health and well-being. In summary, while AI-generated exercise programs hold great promise, their successful and responsible integration into health and fitness requires ongoing evaluation, interdisciplinary collaboration, and a balanced approach that prioritizes both innovation and individual well-being.

Therefore, according to the present literature and discussions presented in this article, it is clear that while AI-generated exercise programs offer innovative

approaches to fitness and rehabilitation, there remains a significant need for their rigorous evaluation and refinement. Addressing these challenges calls for a multifaceted approach that encompasses technological advancements, ethical considerations, and collaborative efforts across various disciplines. To ensure the efficacy, safety, and relevance of these AI-driven solutions in the health and fitness sector, the following suggestions are proposed:

1. **Enhanced Collaboration Between AI Developers and Health Experts:** Strengthen collaboration between AI developers and health care professionals to ensure that AI-generated exercise programs are scientifically valid and tailored to individual health needs.
2. **Regular Updates and Training:** Continuously update AI algorithms with the latest research and health guidelines. Provide regular training for health professionals to effectively integrate and oversee AI-generated programs.
3. **Robust Validation Tools:** Develop and utilize comprehensive tools like i-CONTENT for regular assessment and validation of AI-generated exercise programs, ensuring their accuracy and safety.
4. **Incorporating User Feedback:** Regularly collect and analyze user feedback to understand the effectiveness and user-friendliness of the programs, making necessary adjustments based on real-world experiences.
5. **Ethical and Privacy Considerations:** Maintain strict ethical standards and data privacy protocols to protect user information, addressing any ethical concerns related to AI in health and fitness.
6. **Research and Development Investments:** Encourage further research and investment in developing more

sophisticated AI models that can better mimic human decision-making in physical training and health management.

7. **Public Awareness and Education:** Raise public awareness about the benefits and limitations of AI-generated exercise programs, educating users on how to effectively utilize these tools alongside traditional health and fitness practices.

Transparency Statement

The author is willing to share the data, analytics methods, and study materials with other researchers. The material will be available upon reasonable request.

Acknowledgments

I express my sincere gratitude to the healthcare and AI professionals for their insights, my academic peers for their constructive feedback, the technical and editorial teams for their assistance, and my friends and families for their support throughout this project.

Declaration of Interest

The author reports no conflict of interest.

Funding

This research received no external funding.

Ethics Considerations

None.

References

1. Tirado-Olivares S, Navío-Inglés M, O'Connor-Jiménez P, Cózar-Gutiérrez R. From Human to Machine: Investigating the Effectiveness of the Conversational AI ChatGPT in Historical Thinking. *Education Sciences*. 2023;13(8):803. <https://doi.org/10.3390/educsci13080803>
2. Williams R, Hopkins S, Frampton C, Holt-Quick C, Merry SN, Stasiak K. 21-Day Stress Detox: Open Trial of a Universal Well-Being Chatbot for Young Adults. *Social Sciences*. 2021;10(11):416. <https://doi.org/10.3390/socsci10110416>
3. Sakane N, Suganuma A, Domichi M, Sukino S, Abe K, Fujisaki A, et al. The Effect of a mHealth App (KENPO-app) for Specific Health Guidance on Weight Changes in Adults With Obesity and Hypertension: Pilot Randomized Controlled Trial. *JMIR Mhealth Uhealth*. 2023;11:e43236. [PMID: 37043287] [PMCID: PMC10134028]. <https://doi.org/10.2196/43236>
4. Li Y, Li X. The Artificial Intelligence System for the Generation of Sports Education Guidance Model and Physical Fitness Evaluation Under Deep Learning. *Front Public Health*. 2022;10:917053. [PMID: 36016903] [PMCID: PMC9395691]. <https://doi.org/10.3389/fpubh.2022.917053>
5. Rhon D, Boyles R, Cleland JA. One-Year Outcome of Subacromial Corticosteroid Injection Compared With Manual Physical Therapy for the Management of the Unilateral Shoulder Impingement Syndrome. *Annals of Internal Medicine*. 2014;161(3):161-9. [PMID: 25089860] <https://doi.org/10.7326/M13-2199>
6. Matsuo T, So R, Tanaka K, Mukai C. High-intensity interval aerobic exercise training (HIAT) in occupational health. *The Journal of Physical Fitness and Sports Medicine*. 2021;10(3):145-50. <https://doi.org/10.7600/jpfs.10.145>

7. Thomas JH, Martijn CK, Nico LUvM, Tracey H, Kari B, Peter T, et al. i-CONTENT tool for assessing therapeutic quality of exercise programs employed in randomised clinical trials. *British Journal of Sports Medicine*. 2021;55(20):1153. [PMID: 33144350] [PMCID: PMC8479742]. <https://doi.org/10.1136/bjsports-2019-101630>
8. Wei S, Huang P, Li R, Liu Z, Zou Y. Exploring the Application of Artificial Intelligence in Sports Training: A Case Study Approach. *Complexity*. 2021;2021:4658937. <https://doi.org/10.1155/2021/4658937>
9. Peluso I. Exercise and Diet: The Unmentionable Truth. *International Journal of Clinical Nutrition & Dietetics*. 2015;1. <https://doi.org/10.15344/2456-8171/2015/104>
10. Ghorashi N, Ismail A, Ghosh P, Sidawy A, Javan R, Ghorashi NS. AI-powered chatbots in medical education: potential applications and implications. *Cureus*. 2023;15(8). PMID: 37692629] <https://doi.org/10.7759/cureus.43271>