

Using ChatGPT in the field of kinesiology: Opportunities and considerations

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Abstract:

On November 30, 2022, the emergence of a super-large artificial intelligence (AI) chatbot called ChatGPT (chat generative pre-trained transformer) astonished the world with its exceptional performance capabilities. ChatGPT is a trained AI chatbot developed by an American AI research laboratory called OpenAI. It provides users with a dialogue-format online chat that responds to and follows up on questions, admits mistakes, challenges incorrect premises, and rejects inappropriate requests. ChatGPT has evolved tremendously in just a few months (GPT-4 was released on March 14, 2023) to include multiple advanced features, such as image and infographic analysis, extended text processing, and safer and more accurate responses. Many experts, professionals, and scholars in various fields are looking at both the advantages and disadvantages of using this tool, and the field of kinesiology is no exception. Because technological advancement is inevitable, people working in a range of industries are considering how and to what extent they can incorporate ChatGPT and other tools that offer similar capabilities and features (e.g., Google Bard, Microsoft Bing, and Chatsonic) into their daily work. As in other fields of study, ChatGPT can be deployed to promote work efficiency for practitioners, learners, educators, and researchers within the field of kinesiology. Stakeholders should learn and stay updated with the latest version of ChatGPT to enhance overall performance in each subdiscipline of kinesiology while experimenting with its new features to obtain more accurate and productive responses. The purpose of this article is to discuss how ChatGPT can be used in the field of kinesiology, and more specifically in the areas of exercise science, physical activity and health promotion, physical education, and sport management, along with topics related to accuracy optimization, its use in higher education, challenges, concerns, ethical considerations, and future directions.

Key Words: Artificial intelligence, chatbot, large language model, sport, physical activity

Introduction

On November 30, 2022, the emergence of a super-large artificial intelligence (AI) chatbot called ChatGPT (chat generative pre-trained transformer) astonished the world with its exceptional performance capabilities. ChatGPT is a trained AI chatbot that was developed by an American AI research laboratory called OpenAI. It provides users with a dialogue-format online chat that responds to and follows up on questions, admits mistakes, challenges incorrect premises, and rejects inappropriate requests (OpenAI, n.d.). ChatGPT has evolved tremendously in just a few months (GPT-4 was released on March 14, 2023) to include multiple advanced features, such as image and infographic analysis, extended text processing, and safer and more accurate responses (OpenAI, 2023). Many experts, professionals, and scholars in various fields are looking at both the advantages and disadvantages of using this tool, and the field of kinesiology is no exception.

Because technological advancement is inevitable, people working in a range of industries are considering how and to what extent they can incorporate ChatGPT and other tools that offer similar capabilities and features (e.g., Google Bard, Microsoft Bing, and Chatsonic) into their daily work. As in other fields of study, ChatGPT can be deployed to promote work efficiency for practitioners, learners, educators, and researchers within the field of kinesiology. Stakeholders should learn and stay updated with the latest version of ChatGPT to enhance overall performance in each subdiscipline of kinesiology while experimenting with its new features to obtain more accurate and productive responses. The purpose of this article is to discuss how ChatGPT can be used in the field of kinesiology, and more specifically in the areas of exercise science, physical activity and health promotion, physical education, and sport management, along with topics related to accuracy optimization, its use in higher education, challenges, concerns, ethical considerations, and future directions.

What are AI Chatbots and ChatGPT?

AI is the simulation of human intelligence processes by machine technology, especially computer systems, and its use has been increasing rapidly in our daily lives (Minh et al., 2022). A chatbot is one example of an AI system. A computer program operated by AI and natural language processing, a chatbot offers an online conversation system for users via methods such as text or text-to-speech (Chaves & Gerosa, 2021). Familiar examples of chatbots include instant frequently asked questions (FAQs) response systems and real-time customer conversation systems that offer online support to customers or users across companies, organizations, and industries. Pérez et al. (2020) found in their systematic review that chatbots have also been employed in education, highlighting that chatbots could assist in teaching and learning under similar conditions as human tutors.

Based on the foundational concept of the chatbot, ChatGPT can be considered a more advanced and dynamic version of the chatbot, using a large language model (LLM) that employs deep learning techniques with a huge data set of publicly available information to comprehend, translate, summarize, generate, and predict new content within an AI algorithm (OpenAI, n.d.). Although a chatbot is typically designed and utilized to assist a business by interacting with its customers or users through predetermined decision scripts (e.g., instant FAQs response system; Sethi, 2020), ChatGPT is not limited to a particular area. ChatGPT continues to develop its capabilities by accumulating more data from analyzing patterns, practices, tones, and aspects of its use among people around the world. This unique feature of ChatGPT could potentially elicit multiple benefits in the field of kinesiology. The following sections will discuss the potential uses of ChatGPT in four areas of kinesiology: exercise science, physical activity and health promotion, physical education, and sport management.

Potential Uses of ChatGPT in Exercise Science

Exercise science focuses on body mechanics, acute and chronic physiological responses to exercise, and energy metabolism to promote physical activity, improve quality of life, enhance human performance, and prevent diseases and injuries (Potteiger, 2021). A previous study emphasized the crucial role of practical applications in translating scientific knowledge into tangible benefits for individuals and communities in exercise science (Falkner et al., 2006). ChatGPT can be a valuable tool for exercise scientists (i.e., exercise physiologists, biomechanists, strength and conditioning specialists, sports coaches, and athletic trainers) to boost their practices in ways such as program design, research, and communication.

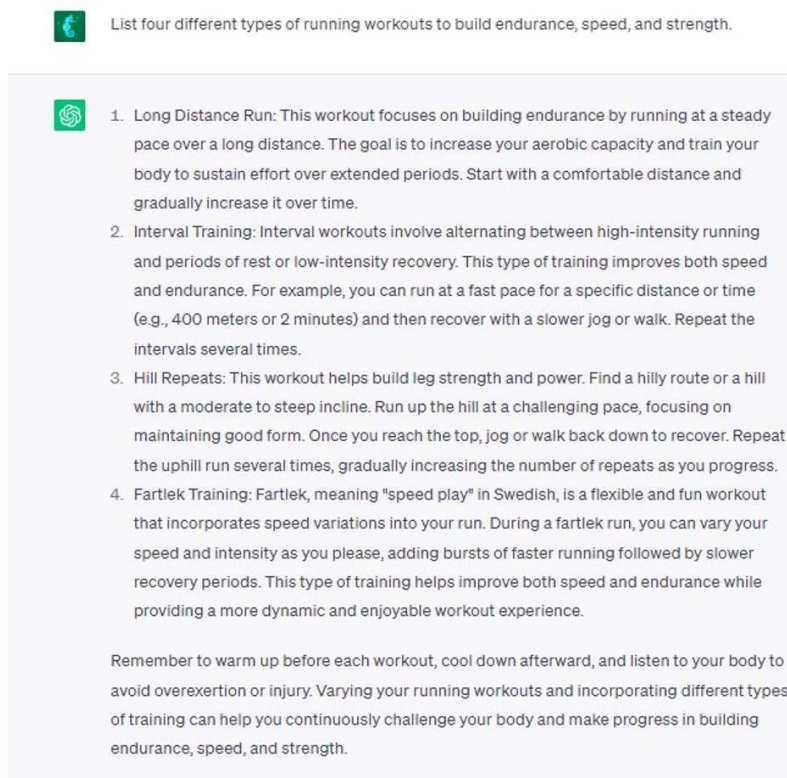
According to the American College of Sports Medicine, the primary objective of exercise scientists is to design appropriate exercise prescriptions (e.g., exercise mode, duration, and intensity) to improve quality of life and sport-related performance (Potteiger, 2021). Exercise scientists could get generalized exercise prescriptions via ChatGPT. For example, Figure 1 displays running workouts for building endurance, speed, and strength generated from a user prompt. ChatGPT can also provide specific intensity, sets, repetitions, and rest periods based on factors such as age, fitness level, and injury history. Although ChatGPT can create a general exercise program, novice exercise scientists who have recently completed a degree and/or a certificate program may derive greater benefits from it as a baseline. However, experienced exercise scientists are able to utilize ChatGPT as a teaching tool for interns and new research personnel to develop exercise training programs that optimize sport-related performance with the proper periodization strategies.

Research plays a vital role in exercise science, allowing scientists to evaluate hypotheses and assess the effectiveness of acute and chronic exercise adaptations for targeted populations (Pescatello et al., 2014). With the assistance of ChatGPT, exercise scientists can improve their research by facilitating study design, procedure, and data analysis; this can generate new insights and knowledge, ultimately advancing the field of exercise science. Exercise scientists, especially biomechanists, typically deal with an extensive data set during human locomotion.

For example, to prevent sports-related injuries in runners and enhance their performance, it is crucial to analyze running mechanics data (e.g., foot strike patterns, a center of pressure, ground reaction force, and muscle activations) using 3D motion capture, force plates, and electromyography systems. The deeper level of analysis required necessitates a significant amount of data per given unit of time. ChatGPT could reduce time and effort in data analysis and preparation, such as filtering and smoothing data before running a statistical analysis.

ChatGPT can also provide guidance for developing questionnaires, checklists, and communication scripts with a smooth and professional tone. Effective communication is imperative for exercise professionals to prescribe personalized exercise programs for their clients. For example, strength and conditioning specialists must evaluate the physiological capacities, such as repetition maximum and maximum oxygen consumption, and consider training goals, injury history, experience, sleep pattern, nutrition, and even mental status prior to designing an exercise program (Haff & Triplett, 2015). Furthermore, exercise professionals should be cautious when prescribing exercise programs to clients and athletes with metabolic diseases or injuries. They need to communicate openly to better understand individual needs, helping them tailor exercise programs to avoid detrimental effects and optimize performance with proper progressive overload (Burton & McCormack, 2021). ChatGPT can offer a valuable baseline from which experienced exercise scientists can apply their expertise.

Figure 1. ChatGPT-Generated Ideas for Running Workouts



Potential Uses of ChatGPT in Physical Activity and Health Promotion

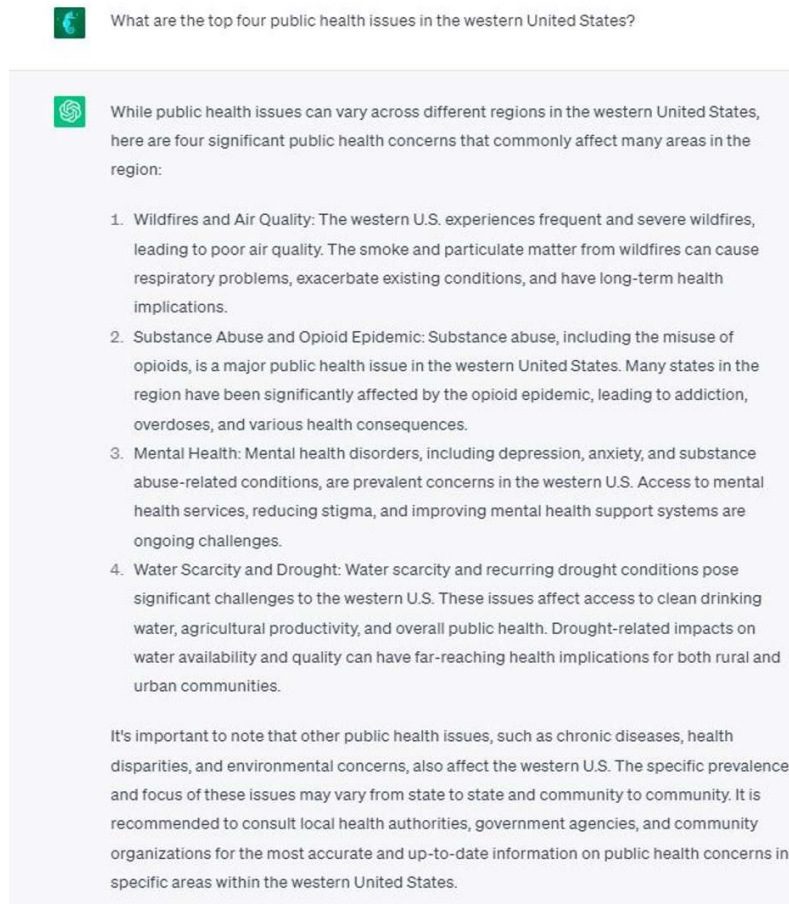
Kinesiology also encompasses physical activity and health promotion that concentrates on discovering and implementing best practices to encourage physical activity in various populations and settings, identifying risk factors associated with chronic diseases, and measuring the impact of physical activity and health promotion efforts (Cardinal et al., 2015). ChatGPT could play a unique role in supporting individuals, practitioners, and professionals in multiple community health settings. For example, ChatGPT can provide information regarding suitable and effective strategies for regular physical activity, exercise, and nutrition management that help individuals enhance their quality of life. With its extensive data set, ChatGPT can also help people identify risk factors associated with chronic diseases (e.g., obesity, diabetes, and cancer) based on their health conditions. Consequently, it offers strategies for reducing risk factors, such as controlling blood pressure and cholesterol levels; caring for mental health (e.g., stress management); and avoiding a range of harmful substances, such as tobacco and alcohol, to assist users in making informed decisions. In addition, people can obtain information about health programs and services in their communities according to their needs (e.g., rehab centers for those who struggle with substance abuse).

Community-based health promotion models aim to foster community support and prevention programs by promoting physical activity based on social and environmental influences across various age groups (Merzel & D'Afflitti, 2003). ChatGPT can be an assistive tool for community-based models. For example, community-based programs offered by governmental and nonprofit organizations, such as the Healthy People 2030 project by the Office of Disease Prevention and Health Promotion (ODPHP) and sports and recreation programs by YMCAs and YWCAs, can obtain information through ChatGPT for specific populations to provide them with appropriate and relevant activities and services. Since the goal of Healthy People 2030 is to prevent disease and injury, improve health, and enhance the quality of life by increasing the availability of educational and community-based programs (ODPHP, n.d.), program implementers and corresponding stakeholders must collect data regarding the status of the community. ChatGPT can provide this data, including racial demographics, socioeconomic statuses, educational levels, and any relevant information that can potentially affect the programs. ChatGPT can list public health issues in the community (see Figure 2 for a sample prompt and response from ChatGPT) and recommend community-based programs and services in response to the issues.

Furthermore, ChatGPT can change the shape of healthcare programs and services. Healthcare providers and professionals can use ChatGPT as a virtual assistant for bureaucratic tasks, such as writing clinical documents for clients and recommending diagnostic advice and options according to clients' symptoms. Typically, human practitioners write clinical notes, letters, and documents containing medical history, treatment plans, and follow-up procedures in professional language that uses medical terminology, making it difficult for clients to understand. ChatGPT can help simplify clinical documents for better client comprehension. Additionally, following the COVID-19 pandemic, telemedicine, also known as a remote clinical service, has drastically increased in the United States

(Loeb et al., 2020). ChatGPT can enhance the telemedicine system through AI-based remote management strategies, providing a virtual appointment booking system and helping patients receive and manage their health information and treatments.

Figure 2. ChatGPT-Generated Response to Public Health Question



Potential Uses of ChatGPT in Physical Education

Physical education in K–12 schools is essential in teaching children and adolescents to live active and healthy lifestyles (Centers for Disease Control and Prevention, 2014). Physical education is an academic subject with a well-rounded, sequential K–12 curriculum based on national physical education standards. The curriculum should focus on developing students’ physical competency and knowledge of movement so they can safely enjoy a variety of activities throughout their lifetimes (Society of Health and Physical Educators [SHAPE America], 2014). Killian et al. (2023) discussed the use of ChatGPT in physical education teacher education, sharing that “we may begin to see the potential value of the tools for knowledge construction and idea generation,” and ChatGPT could play a critical role in physical education by aiding in curriculum development, instructional strategies, and assessment practices. While in-service teachers should theoretically have the knowledge and skills to successfully plan and deliver high-quality physical education, many still seek new ideas from a variety of sources, including ChatGPT.

For example, ChatGPT can assist in creating annual, unit, and lesson plans along with relevant learning objectives and student learning outcomes for physical activities or sports. Moreover, ChatGPT could provide various teaching resources tailored to grade level, age group, and skill level. ChatGPT can help teachers rapidly generate a well-designed curriculum for K–12 physical education that contains grade-level outcomes appropriate for students’ developmental stages. This curriculum can facilitate active learning environments where students can apply and demonstrate their knowledge and skills through physical activities.

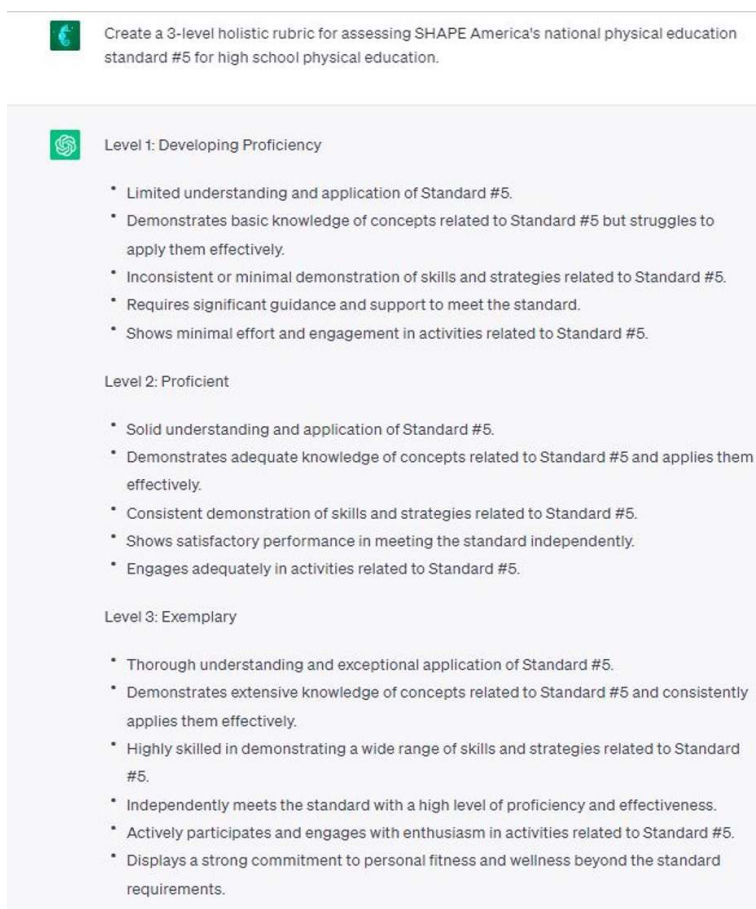
ChatGPT could also help teachers to improve their content knowledge and pedagogical practices by providing teaching materials and instructional strategies, especially for unfamiliar sports or nontraditional physical activities. For example, ChatGPT can assist in summarizing the history, concepts, and rules of tennis in a one-page handout. Furthermore, ideas of related drills or activities for a particular tennis skill and tactic can be generated to offer appropriate practice tasks for students according to corresponding grade-level outcomes.

ChatGPT can produce those resources with a specific number of words as requested so teachers can create resources for their instruction. In addition, ChatGPT can suggest innovative physical activities to promote specific aspects of national or state-level standards. For instance, the National Physical Education Standard 5 emphasizes developing students' respect for themselves and others (SHAPE America, 2014). ChatGPT can specifically target this goal, providing novel games that promote self-regulation and collaboration based on students' diverse backgrounds and interests.

To assist teachers in helping their students identify their strengths and weaknesses and adjust their knowledge and skills, ChatGPT could provide real-time formative assessment. Using the information in the instructional materials, ChatGPT can produce different assessment methods, such as multiple-choice or short-answer quizzes. At the same time, ChatGPT could develop an analytical or holistic assessment rubric aligned with lesson objectives to assess students' skills or knowledge in particular physical activities and sports. The rubric can help teachers gain a comprehensive understanding of student learning outcomes, identify student needs, and provide personalized feedback to improve their academic growth. Figure 3 displays a prompt to ChatGPT to create a holistic rubric for assessing National Physical Education Standard 5 and providing three levels of proficiency.

Accordingly, teachers can facilitate more meaningful communication with stakeholders outside of class, including parents, other teachers, and administrators, to ensure everyone is on the same page. By leveraging this approach, physical education teachers can boost the supportive, inclusive, and active learning environment that enhances academic excellence.

Figure 3. ChatGPT-Generated Rubric for Physical Education



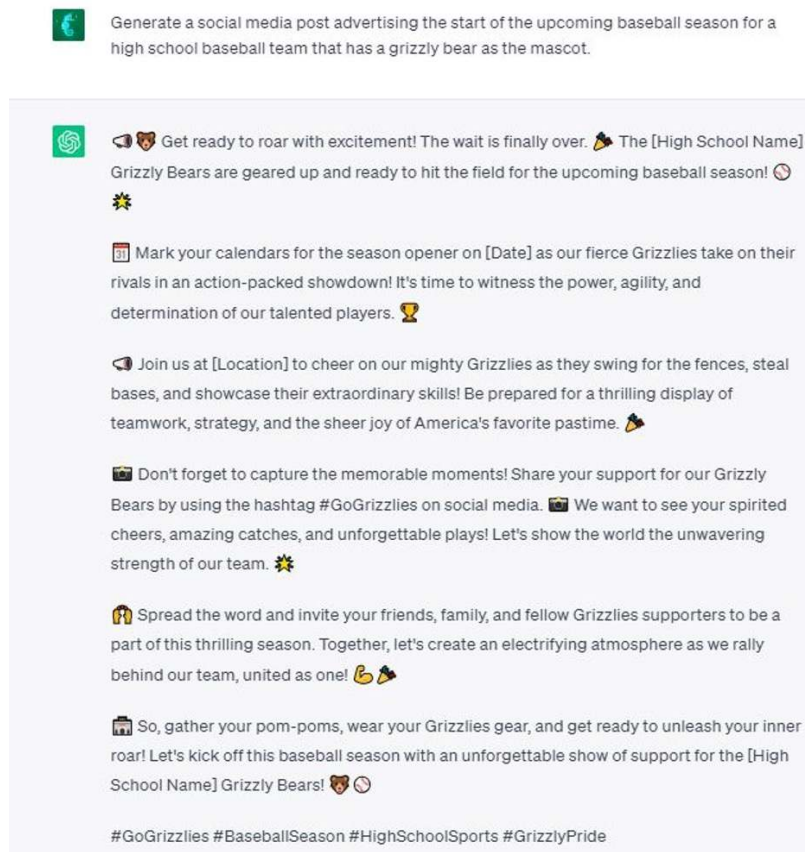
Note. Partial response presented due to screen view.

Potential Uses of ChatGPT in Sport Management

Sport management is an interdisciplinary field that focuses on the business aspects of sports while involving the skills necessary for planning, directing, budgeting, and organizing goods and services produced by sports activities and organizations (DeSensi et al., 1990). ChatGPT can transform the role of professionals responsible for managing sports teams, leagues, facilities, events, marketing, public relations, finance, social media, and other unique characteristics and challenges of the sports industry.

Given the nature of ChatGPT, it could generate a large volume of sports-related content, including articles for websites, blogs, and social media posts for sports media, marketing, and advertising purposes, which historically requires considerable time from employees (e.g., directors, reporters, and journalists). For example, Figure 4 displays social media post examples generated by ChatGPT. ChatGPT could promote work efficiency by providing timely content to serve the needs of sports fans.

Figure 4. ChatGPT-Generated Social Media Posts



Sport analytics uses data analysis techniques and statistical models to extract meaningful insights and patterns from sports-related data. ChatGPT could be used as a virtual coaching assistant by providing tips, logistical support, tactics, event schedules, player evaluations, and game strategies.

Coaches and personnel traditionally manage their athletes by tracking their performance and health. ChatGPT could help coaches analyze players' movements and other relevant data to predict potential injury risks and aid in injury-prevention strategies (e.g., modification of training programs or player workload).

Considering the power of data and advanced analytics in sports, ChatGPT could analyze large volumes of sports data, such as player performance data, game statistics, and historical data, providing feedback on individual player performance while helping athletes improve their skills and performance on and off the field.

Historically, this analytical process was primarily the result of data collection and coding by individuals with backgrounds in math, economics, and computer science. However, ChatGPT provides the analytical code needed for advanced programming (e.g., R and Python), allowing sports data analysts and engineers to better assist coaches and teams in making data-driven decisions while gaining a competitive advantage.

Finally, ChatGPT may play a significant role in enhancing fan engagement. For example, it could provide real-time updates on scores, game schedules, and other important information, enabling fans to stay current on the latest developments in their favorite sports and teams.

ChatGPT could communicate with fans through social media, messaging platforms, and other channels to answer their queries and offer unique insights into their favorite teams and players. Fans could have more interactive and personalized experiences, such as quizzes, trivia games, and polls, and get individualized recommendations through ChatGPT.

By leveraging these advantages, sports professionals could help fans understand the game's nuances, build their knowledge of the sport, and develop a deeper appreciation, enhancing their engagement. Table 1 presents the summary of potential uses of ChatGPT in four areas of kinesiology discussed above.

Table 1. Potential Uses of ChatGPT in Kinesiology

Area of Kinesiology	Potential Uses of ChatGPT
Exercise Science	<ul style="list-style-type: none">Exercise professionals can develop an optimized exercise training program with specific training volume and periodization strategies tailored to meet an individual's goals and needs based on general recommendations from ChatGPT.Exercise scientists can reduce the time and effort required for data preparation tasks (e.g., filtering and smoothing), leading to a more efficient and streamlined data analysis process.Exercise professionals can utilize ChatGPT to improve their communication skills with clients, patients, and athletes to help them achieve their training goals safely and effectively, minimizing the risk of overtraining or injury.
Physical Activity and Health Promotion	<ul style="list-style-type: none">Individuals can obtain information regarding suitable strategies for regular physical activity, exercise, and weight and nutrition management.Community-based programs (e.g., YMCAs) can obtain necessary information for specific populations to provide them with relevant activities and services.Healthcare providers and professionals can use ChatGPT as a virtual assistant in bureaucratic tasks (e.g., writing clinical documents for clients).
Physical Education	<ul style="list-style-type: none">Teachers can create curricula with developmentally appropriate grade-level outcomes for K–12 physical education.Teachers can gain content knowledge and ideas for pedagogical practices by accessing teaching materials and instructional strategies.Teachers can design assessments that help them gain an understanding of student learning outcomes and provide students with meaningful feedback for their academic growth.
Sport Management	<ul style="list-style-type: none">Sports professionals can generate a large volume of timely sports-related content for media, marketing, and advertising.Sports managers can enhance fan engagement by providing real-time updates on scores, game schedules, and other important information.Sports data analysts and engineers can collect, organize, visualize, and analyze sports data (e.g., performance statistics) to assist teams, leagues, and organizations in making data-driven decisions.

Optimizing Accuracy with ChatGPT Through Prompt Engineering

When using ChatGPT to achieve optimal outcomes in the field of kinesiology, it's important for professionals to employ effective communication techniques with the LLM. One helpful technique for creating effective communication is prompt engineering, which involves creating a skillful and successful dialogue between the user and the AI in the act of collaboration (Oppenlaender et al., 2023). This process is vital when working with natural language models like ChatGPT because the prompts provided are the instructions that guide what kind of response will be provided. In the case of natural language models like ChatGPT, this process is like programming using natural language (Reynolds & McDonell, 2021). To ensure that ChatGPT produces the desired output, users should incorporate detailed task descriptions to guide the LLM (Short & Short, 2023). By providing a well-structured and clear request for information, kinesiology professionals can help ChatGPT understand their needs and produce accurate and relevant responses. Doing so improves the overall quality of the output and helps establish a sense of trust and reliability in the AI-powered assistant.

Having systematic prompt engineering strategies will provide better outputs. One helpful approach is the error identification method, which involves asking ChatGPT to provide the logic, assumptions, ambiguities, and limitations behind the generated output (Schmidt et al., 2023). Additionally, the user could prompt ChatGPT to provide specific examples of evidence that should be used to support the provided answer. This method effectively improves the output quality generated by ChatGPT. Another idea for successful prompt engineering involves the user giving ChatGPT a specific persona (White et al., 2023); a physical education teacher could prompt ChatGPT to pretend it is a leading expert in physical education pedagogical content knowledge. A template approach is also another successful method of prompt engineering in which the user creates and saves document templates, such as emails or writing reports. For example, users could develop prompt templates for common emails (i.e., follow-ups, meeting requests, and thank-yous) and decide which parts should be left static and which should be customizable. The template can provide static prompts such as writing style, structure, introduction, subject context, and closing phrases.

The Use of ChatGPT in Kinesiology in Higher Education

Although ChatGPT cannot replace the value of human expertise in higher education, it can be a beneficial tool for educators who teach kinesiology courses to supplement their expertise and create a more engaging and interactive learning environment (Iskender, 2023). With the educators' judgment, ChatGPT can provide valuable information on topics within each subdiscipline in kinesiology. Faculty members and instructors can develop course syllabi and contents with weekly plans, which can help students stay organized and understand the structure of the course (Zhu, 2007). ChatGPT can also produce teaching materials for kinesiology courses, including handouts and summaries that cover essential concepts or explanations of topics and theories in each subject to improve students' understanding of movement and related topics. ChatGPT can also generate in-class quizzes and assessments to target specific course learning outcomes, helping faculty assess student understanding and tailor their teaching approach accordingly. In addition, ChatGPT can provide detailed rubrics for course assignments, which can help ensure that students understand the expectations for their work and specific learning goals. Furthermore, ChatGPT can assist instructors in developing new ideas for teaching methods to enhance student engagement and improve retention of movement concepts in kinesiology.

ChatGPT can also be beneficial to researchers in the field of kinesiology. First, it can be useful for collecting, classifying, and analyzing big data sets related to human body movement and physical activity. For example, when researchers develop algorithms that identify patterns in motor development or recognize linguistic descriptions of human body movement, ChatGPT can interpret those procedures using appropriate prompts. Also, ChatGPT can help researchers conduct a literature review through a simple list of keywords.

By entering keywords as needed, ChatGPT can create a list of relevant journal articles with summaries of their major findings. ChatGPT has limitations in the interpretation, sourcing, and credibility of academic data, so an AI-based scientific research search engine, such as Consensus or Perplexity, could be used together to double-check the data, saving researchers time and effort in seeking and synthesizing large volumes of literature. Moreover, in the context of interactive interfaces for research intervention in kinesiology, ChatGPT can be used to understand participants' responses and guide them to the next step. For example, ChatGPT can provide knowledge and instructions to help participants perform exercises adequately based on their specific needs, preferences, and goals.

Challenges and Concerns of Using ChatGPT in Kinesiology

ChatGPT, along with other AI-based systems, has the potential to influence the field of kinesiology positively; however, we must address its possible challenges. Although ChatGPT will self-improve by generating its own criticism and solving errors over time, it may not understand or be familiar with specialized terminology used in kinesiology and thus may provide limited kinesiology-specific knowledge. In sport management, for example, algorithms may not account for the impact of human factors, such as team rivalries, a visiting team's noisy fans, and players' personal circumstances on game outcomes (Davenport, 2014). In addition, ChatGPT cannot provide the emotional support, motivation, and encouragement of a human coach or therapist. Because kinesiology involves humans who can be unpredictable and emotional, interaction and personalization are critical. Prescribing accurate, individualized exercise based on athletes' medical conditions, training goals, injury history, fitness level, and body composition requires interacting with them, not simply providing a general prescription.

Computer algorithms such as ChatGPT rely on data analysis and statistics to make predictions or decisions, but the data may have gaps or inherent biases (Cribben & Zeinali, 2023). For example, an algorithm may not adjust for changes during a game through injuries or player substitutions, resulting in discriminatory responses and inaccurate diagnoses and predictions. In addition, data created and collected might be inherently biased because the original creators may have processed and provided it with prejudiced intentions.

This is because the data used to train ChatGPT is collected from various sources on the internet, which can contain inherent biases present in human-generated content, and these biases may reflect societal prejudices related to race, gender, religion, and other factors. As a result, data may not represent diverse perspectives and experiences, leading to underrepresentation or misrepresentation of certain groups or topics.

The information ChatGPT provides for physical activity and health promotion should be used cautiously (Lee, 2023) because this area is connected with human health. If ChatGPT generates inaccurate or misleading information without access to a user's medical history, physical limitations, and other individualized factors, ChatGPT could negatively impact their health conditions.

This specific concern may directly link to ethical considerations, which will be discussed in the following sections. Ultimately, it will be the user's responsibility to understand that "ChatGPT may produce inaccurate information about people, places, or facts" (OpenAI, n.d.) and that they must put responses through their own expert filters. ChatGPT should be considered an assistant rather than a replacement for human experts.

Within the field of physical education, it is essential to consider the school context and each student's individual characteristics when designing physical education curricula, lessons, and assessments, highlighting the need for teachers to put ChatGPT responses through their professional filter. Killian et al. (2023) cautioned that using ChatGPT for teaching may "foster a sense of dependence...and limit teachers' natural curiosity, sense of creativity, contextual awareness, and suppress active and responsive problem-solving strategies needed within a teaching and learning environment."

Ethical Considerations for Using ChatGPT in Kinesiology

Using ChatGPT in the field of kinesiology raises several ethical considerations that must be addressed. Kinesiology often involves collecting personal and sensitive information about individuals' health, fitness, and performance. It is crucial to ensure that the data collected through ChatGPT interactions are handled securely, following best practices for data protection and privacy. ChatGPT, like any AI model, may not always provide accurate or reliable information. The limitations and potential errors of the AI model should be communicated clearly to users, emphasizing that the information provided is based on training data and may not always be up-to-date or applicable to individual circumstances. In kinesiology, it is crucial to ensure that ChatGPT does not introduce bias based on gender, race, or socioeconomic status. Careful consideration should be given to the selection and curation of training data to minimize bias, and ongoing monitoring of the model's outputs is necessary to identify and address any potential biases. Although ChatGPT can provide assistance and information, it should not replace the expertise and professional judgment of human kinesiologists. Adequate supervision and oversight by qualified professionals are essential to ensure the responsible use of AI in kinesiology. Feedback from users and professionals in the field should be actively sought and incorporated into the model's development and improvement processes.

Therefore, in the context of using ChatGPT in kinesiology, it is important to continuously evaluate its ethical implications. Proactive approaches can be adopted to mitigate risks and promote ethical practices through education, rigorous critique, healthy skepticism, and an ongoing exploration of ethical considerations. ChatGPT users should be educated regarding the capabilities, limitations, and potential ethical issues of its use. This knowledge empowers stakeholders to make informed decisions and identify ethical concerns while learning about underlying algorithms, data biases, and potential impacts on privacy and fairness. Rigorous ethical critique on ChatGPT should also be encouraged through discussions, peer reviews, and collaborations among professionals, researchers, and ethicists. This critique should focus on the model's outputs, biases, and potential harm it may cause while striving for continual improvement. Users should recognize that ChatGPT is fallible and be cautious when making decisions based on ChatGPT-generated information. Rather than imposing a moratorium on ChatGPT, adopting an approach of continuous education, critique, and skepticism enables stakeholders to address its risks responsibly. By engaging in thoughtful and open discussions, we can navigate the ethical challenges posed by AI in kinesiology and related fields, fostering a more informed and ethically conscious use of ChatGPT.

Conclusion: Future Directions for Using ChatGPT in Kinesiology

Kinesiology professionals must recognize that ChatGPT is simply a tool. Like many other tools supporting the work of kinesiologists (e.g., software, textbooks, web-based resources, apps), it is up to the user to thoughtfully apply the tool to achieve their desired outcomes. As ChatGPT has acknowledged itself, potential risks and challenges associated with its use in kinesiology include "lack of practical experience, incomplete or biased information, limited contextual understanding, and ethical considerations" (ChatGPT, May 21, 2023, prompt: "Risks and benefits of using ChatGPT in kinesiology"). Professionals must use their best judgment and critically reflect on the information provided before applying it to their work. For example, users must know the appropriate questions, the specific prompts that will generate relevant responses, and how to recognize the limitations, errors, omissions, or even misinformation that might be returned. ChatGPT's algorithms tend to privilege consensus or dominant perspectives that may not be relevant or appropriate in all contexts or situations. Users must have the fundamental prerequisite knowledge in the field to guide the tool into generating responses that are relevant and appropriate to their contexts and be able to critically evaluate the information before applying it. ChatGPT can be a good starting point for many applications but is not likely to generate a sufficient final product.

ChatGPT is rapidly evolving into a more effective and trusted tool, but this tool still has a long way to go. Although challenges, concerns, and ethical considerations for using ChatGPT have been exposed and are anticipated, ChatGPT still holds immense potential to offer promising opportunities for various applications in the field of kinesiology and can help professionals in multiple areas enhance their work performance and achieve their desired outcomes. Continuous research and development should be conducted to improve the model, transparency of its risks and limitations should be addressed, and user education about its capabilities and biases and clear guidelines for responsible use should be developed to uphold its appropriate use and ethical standards. Balancing the benefits and concerns of using ChatGPT is essential for professionals in not only kinesiology but also all fields to ensure it is used as a valuable tool while safeguarding their interests.

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