Arab World English Journal
INTERNATIONAL PEER REVIEWED JOURNAL ISSN: 2229-9327

Arab World English Journal (AWEJ) Special Issue on CALL Number 10. July 2024 Pp.36-42
DOI: https://dx.doi.org/10.24093/awej/call10.3

Evaluating the Effects of Artificial Intelligence Homework Assistance Tools on High School Students' Academic Performance and Personal Development

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Received 02/16/2024 Accepted: 07/18/2024 Published: 07/28/2024

Abstract
Technological advancement in various aspects of life has led to integrating artificial intelligence into educational practices. Students' use of artificial intelligence assistance tools has become more fundamental in academic settings, which evolved a range of positive and negative perspectives. The current study explores the impact of artificial intelligence assistance tools on students' overall personal and academic performance. Hence, this article is significant as it evaluates how Moroccan high school students use artificial intelligence assistance tools to solve their homework assignments. The study attempts to answer to what extent these students rely on these tools and examine the teachers' attitudes and concerns toward the impact of these evolving changes that artificial intelligence has brought to their classrooms. A mixed-method approach is used to achieve the study's objectives, employing both quantitative and qualitative methods. Therefore, the findings indicate that students rely heavily on artificial intelligence to complete their everyday homework tasks, which impedes their learning process and skills acquisition. These findings provide several recommendations to policymakers, parents, educators, and learners to be aware of the adverse effects of the overuse of artificial intelligence assistance tools on students' learning outcomes.

Keywords: Academic performance, artificial intelligence, assistance tools, overreliance, high school students, homework, personal development

Cite as: Tamimi, J., Addichane, F., & Madani, S. A. (2024). Evaluating the Effects of Artificial Intelligence Homework Assistance Tools on High School Students' Academic Performance and Personal Development. *Arab World English Journal (AWEJ) Special Issue on CALL (10)*. 36-42. https://dx.doi.org/10.24093/awej/call10.3

Introduction

The evolution of artificial intelligence (AI) in various fields has transformed the world's dynamics. It has reshaped how individuals interact with information, conduct business, and navigate daily life. The transformative influence of AI is characterized by its ability to analyze vast datasets, make predictions, and complete different tasks effectively.

Artificial intelligence has entered the realm of education, enabling individuals to engage in learning with the assistance of educational tools such as bots. This necessitates aligning the education settings with new technological advancements, aiming to enhance the quality and efficiency of education systems, particularly integrating information and communication technology (Fitria, 2021; Bhutoria, 2022).

The advantages of integrating AI into education are considerable; it "truly changes the paradigm of education to a massive extent, making the system more interactive, engaging, and motivating for the learners" (Bhutoria, 2022, p.8). As a result, the influence of artificial intelligence has compelled the contemporary generation of students to rapidly attain knowledge and skills (Tapalova & Zhiyenbayeva, 2022). Accordingly, concerns are rational and inevitable as there are several crucial aspects to consider when introducing these AI tools to support student learning (Tseng & Warschauer, 2023). It is imperative to thoroughly investigate the varied impacts of using AI assistance tools on students' academic achievements, personal growth, and professional progress.

The recently conducted research about the evolution of AI and its potential impact on students has not directly examined these impacts on high school students. Therefore, this article's primary aim was to fill that gap by investigating the prevalence and motivations behind the utilization of Artificial Intelligence (AI) in homework assignments among high school students in Morocco. By examining the frequency of AI usage, the study aimed to provide insights into the extent to which students rely on AI tools to complete their homework tasks and the reasons driving their adoption of these technologies. The article's objective was also to delve into the effects of employing AI tools by students, exploring how integrating them influences various aspects of their learning experiences and overall development. Hence, this study tends to answer the following research questions:

- To what extent do high school students rely on AI tools to do their assignments?
- What are teachers' attitudes and concerns regarding students' use of these tools?
- How do AI tools impact students' academic and personal development?

The current study used a mixed-method approach to examine the extent to which Moroccan students rely on AI tools for their homework assignments and to cover the main reasons behind using such tools by high school students and how they impact their overall progress.

Review of Literature

The Evolution of Artificial Intelligence

Keeping up with rapid global changes has resulted in the development of new technological systems and tools, each of which has advantages and disadvantages for individuals. Though they generally play a helpful function in simplifying things, they also frequently replace humans' capacity for thought, growth, and improvement. One of these increasingly adopted systems is artificial intelligence

Artificial Intelligence consists of two words: Artificial and Intelligence (Karthikeyan et al., 2021). According to Minsky (1988), Artificial is "something that is made or created by a human

being which ideas are adopted from something exists in nature that has been created by God" (p. 806). At the same time, Intelligence refers to different meanings according to multiple scholars. In other words, intelligence is 'the ability to solve hard problems' (Minsky, 1988). Others define it as 'thinking power' (Banerjee, 2024). In other words, intelligence is the process of using the brain to fix specific issues confronting individuals to develop personally and professionally, however, with the growing changes.

The development of AI-empowered systems has extensively replaced people's intelligence and their ability to think. The definition of AI varies from one scholar to another based on different contexts, but it is mainly introduced as a field of computer science that entails creating computer programs to do tasks that typically require human cognitive intelligence (Saleh, 2019). On a parallel note, AI is the capacity of machines to learn, apply knowledge, and behave intelligently. AI also involves moving items appropriately and operating a range of cognitive functions such as sensing, processing oral languages, reasoning, learning, and making judgments.

Artificial Intelligence and Education

Nowadays, education has shifted from traditional teaching and learning methods concentrating on one-size-fits-all to technology integration to attract students' attention, facilitate learning, manage time, and engage learners (Abill et al., 2024). Recently, with the world's rapid growth, artificial intelligence has emerged as a transformative force in education (Yeruva, 2023). Artificial intelligence in education "involves the application of AI technologies in education (learning), the construction of educational contexts, and the reorganization of major components of education or the reconstruction of educational processes (Yu & Lu, 2021, p.3)." One of the most significant benefits of AI in education is personalized learning, which allows students to learn at their own pace and in a manner that best fits their learning preferences to improve student results (Shrivastava et al., 2023). Using AI enables students to determine their difficulties and provide feedback based on their needs. It includes giving immediate guidance on the content needed and helps them navigate easily.

In addition, AI technology is currently revolutionizing classrooms and schools, greatly simplifying the work of teachers (Lynch, 2018; Wogu et al., 2019). Artificial intelligence tools are mainly created to assist educators by automatically assigning activities, creating tests, grading them, and providing feedback based on what works best for their students. As a result, teachers can efficiently focus on their teaching tasks and save time and energy (Chaudhry et al., 2022).

All in all, implementing Artificial intelligence in education offers excellent opportunities for educators to embrace new approaches and methodologies that facilitate the teaching process and the delivery of the materials taught as well as student retention and development. In other words, AI has been used in education to simplify several activities and tasks, freeing teachers' time to focus on their students and help them develop. AI has brought numerous changes in education, providing many tools that students and teachers frequently use.

AI's Positive Impact on Students' Development

Adopting artificial intelligence (AI) tools in educational settings among students has exerted positive and negative influences on their academic achievement as well as professional and personal development. Recent research on AI technologies has explored and examined the multidimensional aspects of their applications and their impact on various industries, ethical concerns, and potential political, socio-economic, and educational implications.

One benefit of using AI-powered tools in education is allowing teachers and students to personalize the learning process. These tools facilitate teachers' work by designing courses that meet students' interests and learning styles to enhance their knowledge and develop their professional skills (Tapalova & Zhiyenbayeva, 2022).

A study conducted by Bhutoria (2022) argued that using AI technology is crucial for enhancing personalized education by creating a practical learning experience for all learners. When teachers abide by the traditional teaching system, they cannot meet the learning requirements of each learner in their classroom, along with their different intentions and motivations. Therefore, integrating AI with other current technological advancements in the field of education can systematically alter and restructure essential elements in the education system to address and adapt to individual-specific factors. These systems considerably support students' learning outcomes and keep them motivated and engaged (Owan et al., 2023).

The use of AI automatic assessment text-based responses, as an example, addresses the learning needs of students as they provide improved assessment techniques, grading strategies, and evaluation of courses (Gao et al., 2024), which will give students immediate feedback and save teachers' time that would be utilized in looking for innovative ways to develop their teaching and learning strategies (Fitria, 2021). At the language level, for students who learn English as a foreign language, "AI-based writing tools offer functionalities that can help these learners meet expectations placed upon them to communicate effectively in English in academic and career spheres" (Tseng & Warschauer, 2023, p. 259). Thus, adopting such AI-powered tools for writing assignments might be an effective strategy for learning that can empower students' knowledge and skills acquisition (Burkhard, 2022).

Interestingly, the evolution of ChatGPT as one of the most commonly used AI tools among students helps them evaluate their performance in everyday school tasks. It accomplishes tasks by generating human-like texts, translating, completing texts, and answering questions (Skrabut, 2023). Assessment of students' work involves receiving feedback, making adjustments, correcting mistakes, and providing resources for written tasks. ChatGPT can also generate answers to any given question, encouraging students to utilize their knowledge and reasoning skills to evaluate the provided information (Lo, 2023). The interaction between ChatGPT and students increases students' efficiency as it strengthens their creativity, helps them practice their language skills, and intensifies their ability to think critically and autonomously. These benefits, especially in education, go beyond its limitations and concerns (Momesso, 2023).

The interactive "nature of AI-enabled learning systems helps to receive feedback and understand the requirements of the learners based on that and lastly, prescribe suitable learning choices for the learner depending on predictive algorithms" (Bhutoria, 2022, p. 3). In this sense, educators should promote AI literacy, by collaborating with students, to integrate these tools into their learning effectively so that students stay current with the evolving technological advancements and prepare them for future challenges. Students then will gain the confidence to use AI tools and acquire essential skills for their future careers (Tseng & Warschauer, 2023). However, students should use AI-powered tools under the supervision and guidance of their teachers to ensure a safe and effective interaction (Burkhard, 2022).

Indeed, the AI era is characterized by several positive aspects, including personalized learning opportunities that increase students' motivation to explore new technologies and become knowledgeable about them. This has led to the creation of highly efficient educational platforms

that offer diverse learning opportunities and enhance students' professional skills to ensure their future career advancement (Li et al., 2023).

The Negative Impacts of AI on Students' Overall Development

The massive attention AI tools utilization has gained recently raised various concerns in different sectors, mainly education. As students progressively interact with AI tools to do basic tasks, concerns emerged regarding the potential adverse outcomes these tools may have on them. As mentioned previously, one of the main positive benefits of using AI by learners is the opportunity to evaluate their learning objectively. However, the lack of accuracy in the provided results can fail to indicate the actual learning process (Toumi, 2018).

A study conducted by Ahmad et al. (2023) showed that using AI technologies in education can cause laziness and a loss of decision-making capabilities, as well as other security and privacy issues. Students become entirely dependent on these tools when everything is easily performed and automated for them. "The overreliance on AI tools could result in the fragmentation of the learning experience, isolating students from the rich social and collaborative aspects of education" (Pan, 2024, p. 153). This growing prevalence may contribute to increased human reliance, potentially leading to increased passivity (Ahmad et al., 2023). In addition, "AI may reduce the importance of some human cognitive capabilities or make them obsolete" (Toumi, 2018, p. 31). When students' intensive reliance on AI generators such as ChatGPT or any other AI tools deprives them of actual interaction with human teachers and peers. The overreliance on these tools hinders the natural development of social life skills, which are essential for students' professional and personal success (Momesso, 2023), as well as influences the acquisition of fundamental cognitive capabilities (Toumi, 2018).

The frequent employment of artificial intelligence has transformed the skill requirements in numerous traditional sectors. Thus, using AI has initiated uncertainty regarding students' future job opportunities and raised problems about employment and career anxiety (Li et al., 2023). Moreover, other concerns mentioned in the research were mainly about the lack of personalized learning as they may not consider individual needs and preferences. Societal biases embedded in AI systems may lead to biased outcomes, perpetuating existing inequalities in access to these technologies by all students. Besides, the collection and utilization of personal data by AI systems give rise to privacy and security issues and prompt inquiries regarding data protection and consent (Esplugas, 2023). Privacy is influenced by AI systems in various ways, although not always in the anticipated manner. AI systems challenge various aspects related to privacy, such as individuals' usual control over their information and the epistemic privilege often enjoyed in everyday interpersonal interactions (Elliott & Soifer, 2022).

Despite the impact of AI-powered tools and their educational challenges, the potential impacts are still hard to predict (Toumi, 2018). Interestingly, recent research findings have concurred on several overarching concerns associated with using AI technologies in education. These include but are not limited to, a potential overreliance on AI, a decline in critical thinking, and other essential skills that could negatively impact students' future careers. There is also a reduction in individuals' decision-making autonomy, a decreased sense of personal connection within the learning environment, and notable issues related to privacy and security.

Method

The study utilized a mixed-method approach to fulfill its primary objectives, integrating qualitative and quantitative methods. The quantitative method was employed to gather numerical data to examine the frequency and reasons behind the use of AI assistance tools by high school students in Morocco. Additionally, the qualitative method was instrumental in gathering perspectives from teachers regarding the student's use of these tools. This comprehensive approach significantly enhanced the study's results and validity by providing deeper insights into the effects and considerations associated with the use of AI assistance tools on students' academic and personal development.

Participants

The study's selected population sample consisted of high school students from different schools in Fez City. A random sampling method was used to reach as many student participants as possible. Therefore, five randomly involved high schools were used to collect data from students between 14 and 20 years old. The study could reach 115 high school students.

Table 1. *Demographic Description*

Gender:	**Frequency**	**Percentage**
Male	65	57%
Female	50	43%
Schools Names:		
Salahddin EL Youbi	20	17.39%
Youssef Ben Tachfine	31	26.96%
Abdellah EL Aroui	23	20%
Ibn Rochd	29	25.22%
Moulay El Hassan	12	10.43%
Total	115	100%

The study involved a total of 115 student participants; 57% were males and 43% were females. The data revealed an unequal gender distribution as this disparity might be related to students' interest in participating in the study, as male students were more collaborative than female participants. Besides, the included high schools vary from one another. For instance, Youssef Ben Tachfine and Ibn Rochd ranked the highest participation, representing 26.96% and 25.22%. Respectively, Abdellah EL Aroui High School 20%, Salahuddin EL Youbi 17.39%, and Moulay El Hassan 10.43%. These disparities depended primarily on the number of students in each school and their level of engagement. For the participants' educational background, 21.74% were 10th-grade students, 34.78% were first-year baccalaureate, and 43.48% were second-year baccalaureate students representing the highest percentage of participants. These differences helped examine the degree of AI integration in education across Moroccan high schools to enhance the representativeness of the study's findings.

Research Instruments

In this study, data was collected from participants using questionnaires and interviews. The survey questions primarily focused on determining how often and why students use AI tools when completing homework. At the same time, semi-structured interviews were conducted to understand

teachers' perspectives on their students' use of AI and its impact on their academic performance. Combining these methods ensured a comprehensive understanding of the investigated topic.

Research Procedures

Data was collected from high school students and teachers during the first semester of the 2024 academic year using two main research instruments. The questionnaire was an efficient and practical approach to getting information from a large group of Moroccan high school students. The survey was administered in person to students in their classrooms after obtaining permission from the school principals. The questionnaire consisted of two sections, focusing in the first section, on gathering the general background information of the participants. The second part targeted the main research themes about the frequency of AI use, reasons, most commonly used tools, and impact. For the semi-structured interviews, they were conducted face-to-face with teachers in their place of work based on their availability. The interviews supplemented the quantitative method of this paper by providing a qualitative component to the data collection process. These interviews enable the researcher to gain thorough insights into the subject by allowing respondents to express their opinions in a detailed and thoughtful manner.

Ethical Considerations

To adhere to ethical standards in research, all participants in both the questionnaire and the interviews were provided with a consent form to ensure that their responses would remain anonymous and would be utilized solely for academic purposes. Additionally, participants were informed about the study's objectives and were invited to participate voluntarily.

Results

Frequency of Using AI Tools by High School Students

The first question respondents were asked about was the frequency of using AI tools, as the table below illustrates:

Table 2. *Frequency*

	Frequency	Percentage
Frequently	57	50.0%
Occasionally	26	22.8%
Rarely	13	11.4%
Never	18	15.8%
Total	114	100.0%

Based on the students' responses, it is evident that they regularly engage with artificial intelligence, indicating a high frequency of AI use. As a result, 50% of students reported frequent use of AI, highlighting the considerable incorporation of AI tools into their daily academic activities. This demonstrates a notable dependence on such technologies. A teacher confirmed, “Teachers know their students, and they know their real level; I can easily detect students who rely on AI tools to do their assignments.” Indeed, one can understand that teachers hold a significant awareness of their students' level and degree of reliance on AI tools.

Conversely, 15.8% reported never utilizing AI for educational purposes attributing to overall concerns about these tools, limitations imposed by families, or individual preferences. Moreover, 22.8% indicated that their use of AI assistance tools is occasional, suggesting that students may choose to employ AI selectively for specific tasks or in certain settings. Finally, only 11.4% of

respondents noted infrequent use of AI, which could be due to limited access to these tools or insufficient knowledge about keeping pace with technological advancements.

Reasons for Using AI by Students

Table 3. *Students' Reasons for Using AI*

	Frequency	**Percentage**
Does everything for you	20	17.4 %
Easy to use	25	21.7%
Helps in understanding materials	23	20.0%
Provide immediate feedback	28	24.3%
Saves time	19	16.5%
Total	115	100.0%

Among the reasons and motives for using AI by Moroccan high school students is the ability to minimize their learning struggles and challenges. The study's findings (Table 2) showed that a significant percentage (24.3%) of students use AI because it provides immediate feedback on their assignments, allowing them to develop their understanding and make the necessary adjustments "A lot of students find difficulties understanding some given tasks at home, AI facilitates that on them and provides them with the necessary assistance a teacher cannot do." The second most cited reason by 21.7% of respondents was that AI tools are easy to use and do not require much effort to interact with them as they quickly predict their needs.

Additionally, 20.0% mentioned that AI helps them understand materials and provide academic assistance. 16.5% of participants indicated that AI saves time, which illustrates another significant factor related to the efficiency of such tools. In other words, AI becomes an appealing tool for students as it facilitates their learning tasks in just one click. However, this excessive use can lead to overreliance and overuse as 17.4% of respondents claimed that AI Does everything for you." In this sense, one of the interviewed teachers firmly declared: "I used to give students writing assignments as homework, but I discovered that they do not make any effort to write them by themselves; AI does everything for them." From this testimony, teachers seem aware of students' overuse of AI, which minimizes their ability to generate ideas and enhance their writing skills independently.

The Most Commonly Used AI Tools by Students

Table 4. *AI Tools Used by Students to Do Their Homework*

	Frequency	Percentage
ChatGPT	50	43.5%
Oddity	14	12.2%
StudyPool	27	23.5%
TutorEva	24	20.9%
Total	115	100.0%

The data provided above showed the different choices that high school students rely on when it comes to AI tools. Interestingly, 43.5% of students expressed a strong dependency on the ChatGPT tool as one of the most commonly used, highlighting their preferences for its use and the strong acknowledgment that implies an intense tendency towards this popular AI-driven language model.

Interestingly, students mentioned various AI tools, with Studypool being used by 23.5% of respondents to help with their learning and homework. The TutorEva AI tool is used by 20.9% of

the student participants, who indicated a considerable level of adoption of its services as they seek tutoring and educational assistance. While only a smaller percentage (12.2%) of participants selected the Oddity AI tool for its specific features that could help students assess their learning. These findings illustrated a strong bond between students concerning using such tools as they provide multiple learning opportunities such as modeling language, assisting them in generating content, solving problems, providing guidance on various subjects, and aiding in educational tasks. However, high school students' potential dependence on such technologies for various educational or communicative objectives might positively and negatively impact their academic and personal advancement.

Perceptions about the Impact of AI on Students' Development

The new technological inventions have not only paved the way for improvements and development in the educational sphere but also raised new concerns about their excessive use. Hence, the data collected (table 5) demonstrated an extensive variety of student perspectives on the impact of using AI tools on their personal and educational achievements. A large category, around 37.4%, reported that using AI assistance tools helped them improve their academic outcomes. Students believe that AI has a positive influence on their academic performance. Some teachers also supported these attitudes during the interview: "I think AI tools are very beneficial; they make everything seem possible and doable for students. Students should be encouraged to develop their skills to align with the technological advancement of our time."

However, 44.3% of respondents claimed no notable change in their personal and professional productivity. This attitude revealed a neutral position or potential concerns about using AI and its negative impact on student development. This could be related to the 18.3% of students who believe that using AI tools has lowered their academic performance as there are teachers who have negative perceptions towards these tools and do not tolerate using them by students, as one of the teachers argued: "I can't tolerate students' use of such tools they are just going to make them lazy and stupid." Another added, "I believe it is dangerous; students will become empty of basic skills as they get used to depending on robots to think instead of them." For many teachers, using these tools could be harmful as they have concerns about students' creativity and innovation, as it can lead to overreliance and laziness, which indicates that both students and teachers hold different opinions *vis-à-vis* the use of AI.

Table 5. *Students Attitudes about the impact of AI on their academic achievement*

	Frequency	Percentage
Improved	43	37.4%
No change	51	44.3%
Declined	21	18.3%
Total	115	100.0%

> The impact of using AI technology led to the rise of multiple concerns by teachers about developing their students' essential and basic skills. In this context, teachers recommended that "Stakeholders should take this seriously, especially in the educational context; they cannot expect to have a future generation of individuals who are competent enough to fit within social and economic requirements if they do not put some restrictions over the use of such tools." A teacher declared.

Teachers' concerns are increasing as far as students are entirely dependent on AI assistance tools. A teacher noted: "Students have become over-reliant on AI they can't write or solve a problem without checking what the chatbot will suggest. They have lost their self-confidence because they think that they can't provide better than the AI ideas." On a parallel note, another interviewee's teacher said, "I have witnessed many cases of students turning in assignments done by AI. If you ask them about something mentioned to elaborate more on it, they will not be able to provide an answer. They do not even know what they have copied." Consequently, students lose the ability to develop their critical thinking skills as they accept and adopt whatever the chatbot suggests, "how can we talk about using these tools critically by students while they're still in the process of developing these skills? Of course, they will blindly adopt whatever the chatbot gives," a teacher added.

Teachers' concerns and attitudes are justified as they work with high school students, who are still developing their knowledge and essential skills. Therefore, instead of limiting students' understanding of how to use AI assistance tools, efforts should be focused on providing guidance and supervision to ensure that students utilize AI technologies efficiently and moderately.

Discussion

Students are using AI assistance tools more and more for educational purposes, which has raised concerns about how it affects their academic and personal development. This study aimed to investigate these impacts on Moroccan high school students and to respond to teachers' worries about students using these tools excessively and without guidance. As a result, the evaluation of students' use of AI assistance tools to complete their homework has led to several conclusions.

The study's results showed a massive reliance on AI to accomplish simple tasks for students, which could impact their self-confidence as they start to believe that they cannot provide the same quality of ideas as AI. When they overuse AI, students lose control over what they learn and how they learn in a way that negatively affects their critical thinking and sense of creativity. Unlike what has been mentioned by previous studies about the benefits of AI in education, such as personalizing learning (Bhutoria, 2022), motivating students, and keeping them engaged (Owan et al., 2023). This study's findings revealed potential negative impacts on students' personal and academic development when relying entirely on AI technologies to do their school assignments. These impacts are crucial, especially when dealing with students in a critical phase such as high school. Most importantly, the study's outcomes from teachers' perspectives aligned with other research papers which confirmed that using AI technologies in education by students leads to laziness, loss of decision-making capabilities and other cognitive skills, loss of human interaction, and overreliance (Toumi, 2018; Ahmad et al., 2023; Momesso, 2023; Pan, 2024). Thus, using artificial intelligence should be guided and monitored by families, teachers, and educational authorities to intervene and restrict its use by students.

Conclusion

In conclusion, AI tools are essential in transforming how students use them to accomplish homework. However, the study findings also mention teachers' worries and concerns about students' overreliance on these technologies. In other words, teachers fear that students' excessive use of AI can negatively impact their creativity and hinder their acquisition of cognitive skills.

AI has transformed students' learning experiences. On the one hand, it has brought innovation and improvement in the educational sector for both teachers and learners. On the other

hand, it is crucial to consider its drawbacks and challenges. Thus, it is essential to find a balance between using AI as a helpful tool to enhance students' skills without affecting their cognitive abilities and inventive facets. That is to say, by integrating technology wisely, students can keep developing essential skills for the future.

Furthermore, educators must remain cautious and adjust to students' ever-evolving needs. By encouraging collaboration and inquiry, they may ensure that students are using AI effectively. In this way, we can maximize artificial intelligence's ability to improve education and set students on the path to success in the digital age.

Funding: This research is not funded.
Acknowledgments: Not applicable.
Conflicts of Interest: The authors declare no conflict of interest**.**
Authenticity: This manuscript is an original work.
Artificial Intelligence Statement: AI and AI-assisted technologies were not used.

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