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EXTENDED ABSTRACT

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AI-DRIVEN PERSONALIZED ATHLETIC INTERVENTIONS: IMPACT OF THE NEXGEN PROMPT GENERATOR–CHATGPT ON DIETARY AND PHYSICAL TRAINING ADHERENCE AND ENDURANCE PERFORMANCE IN TEAM SPORT ATHLETES

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I. Introduction

This study examines the integration of the novel prompt generator, NExGEN, and ChatGPT on dietary and physical training adherence among team sport athletes over three months [1]. The research also evaluates changes in intermittent endurance performance using the Yo-Yo Intermittent Recovery Test Level 1 [2]. The study explores AI-driven models for personalized interventions, targeting gaps in prompt quality and chatbot efficacy in athletic dietary and physical training recommendations.

II. Methods

The study recruited 21 team sport athletes (12 males, 9 females, aged 18–29 years) from Universiti Teknologi MARA. Participants completed a Physical Activity Readiness Questionnaire and baseline fitness tests, including the Yo-Yo Intermittent Recovery Test Level 1 [3]. Dietary adherence was scored weekly using Nutritionist Pro™, and NExGEN-ChatGPT tailored diet and exercise plans based on athlete-specific data, continuously refined using real-time feedback over three months.

III. Results and Discussion

A. Physical Training Adherence

Physical training adherence started strong (93 ± 3.5% in Week 1) but declined steadily, reaching 66 ± 5.9% by Week 12 ($p<0.001$). Early adherence highlighted the framework's initial success, but significant drops after Week 6 indicate challenges in maintaining engagement. Incorporating adaptive strategies may help sustain long-term compliance in physical training among athletes.

B. Dietary Adherence

Dietary adherence started moderately (40 ± 3.0 in Week 1) but declined steadily, reaching 24 ± 5.2 by Week 12 ($p<0.001$). Significant differences were observed across weeks, with adherence in Weeks 1–3 significantly higher than Weeks 10–12. Clearly, enhancing long-term engagement through personalized feedback and motivation strategies may help address these adherence challenges.

C. Yo-Yo Intermittent Recovery Test Level 1 Performance

Group mean pre-NExGEN-ChatGPT (Pre-NC) and post-NExGEN-ChatGPT (Post-NC) intervention changes in Yo-Yo Intermittent Recovery Test Level 1 (YoYo-IR1). The total length of distance covered in the YoYo-IR1 was significantly different in Pre-NC compared to Post-NC (Pre-NC: 1488 ± 178 vs. Post-NC: 1531 ± 150 m; $p=0.009$, mean change 95% CI = [13, 75]) (Figure 1). Further analysis revealed that the change (Δ) in distance covered between the Post-NC and Pre-NC conditions was positively correlated with physical training adherence ($r^2 = -0.78$, $p=0.005$).
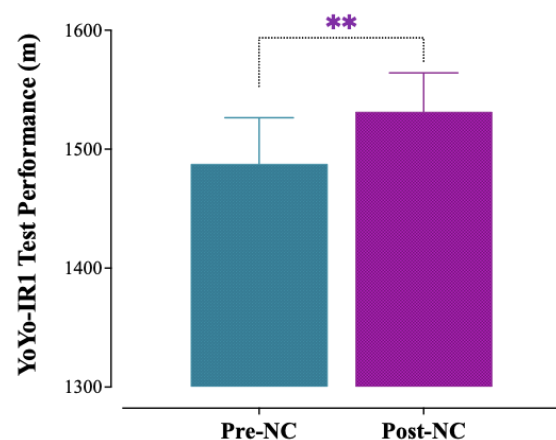

Fig. 1 Changes in Yo-Yo Intermittent Recovery Test Level 1 (YoYo-IR1) performance before (Pre-NC) and after (Post-NC) the NExGEN-ChatGPT intervention.

IV. Conclusions

In conclusion, the NExGEN-ChatGPT framework initially achieved high physical training and moderate dietary adherence among team sport athletes. Although adherence declined over three months, endurance improvements correlated with training consistency. Enhancing the AI model with adaptive and motivational strategies could sustain long-term engagement. These findings support the potential of AI-driven interventions as effective, personalized alternatives to traditional coaching.

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