

**Enhancing aerobic capacity and well-being
through inspired high-intensity interval training for college students**

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ABSTRACT

This study evaluated the effectiveness of the FITPULSE Inspired High-Intensity Interval Training (HIIT) program in improving aerobic capacity, motivation, engagement, and well-being among college students. A quasi-experimental mixed-method convergent parallel design was employed, utilizing pre- and post-test fitness assessments and focus group discussions to examine both physical and psychosocial outcomes. The findings revealed noticeable improvements in aerobic capacity, with male participants' mean scores increasing from 1.5 to 2.64 and female participants' mean scores improving from 1.25 to 2.31 after the 6-week intervention. The program also promoted motivation and sustained engagement through autonomy-supportive activities, self-paced progression, and positive group interaction. These findings aligned with Self-Determination Theory, highlighting the importance of autonomy, competence, and relatedness in encouraging continued participation in physical activity. Overall, the study supports FITPULSE HIIT as an effective, adaptable, and time-efficient fitness intervention for college students.

Keywords: High-intensity interval training, aerobic capacity, endurance, motivation, Self-Determination Theory, college students.

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INTRODUCTION

Aerobic fitness, which refers to the body's ability to efficiently transport and utilize oxygen during prolonged physical activity, is a key component of overall health and well-being. Improvements in aerobic capacity are associated with enhanced cardiovascular health, increased endurance, and better psychological well-being, all of which are crucial for the college student demographic (Venckunas, 2025). Aerobic fitness plays a significant role in reducing the risk of chronic diseases, improving cognitive function, and enhancing overall quality of life. For college students, maintaining adequate aerobic fitness levels can have a profound impact on their physical, mental, and emotional well-being, providing them with the energy and resilience needed to manage academic and social demands. Despite the known benefits, many students engage in insufficient physical activity, contributing to low aerobic capacity levels.

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The promotion of physical fitness and well-being among college students has become a major priority in higher education at both the global and national levels. In the Philippines, CHED Memorandum Order No. 39, Series of 2021, strengthened this commitment through the implementation of the Physical Activity Towards Health and Fitness (PATHFIT) program, aligning with the World Health Organization's recommendations and the United Nations Sustainable Development Goal 3 on health and well-being (Commission on Higher Education, 2021; United Nations, 2025; WHO, 2025). These policies and frameworks emphasize the importance of integrating regular physical activity into students' daily lives to promote better health and prevent lifestyle-related diseases. However, despite these initiatives, many college students continue to experience sedentary lifestyles due to academic demands and technology-driven routines, highlighting the need for more engaging, adaptable, and time-efficient fitness programs.

Despite national policies and international guidelines promoting physical activity, many college students still struggle to maintain consistent participation in exercise due to academic pressures, sedentary lifestyles, and lack of motivation. This concern is especially evident among students in technology-oriented programs, where prolonged screen time and limited movement contribute to poor aerobic capacity, fatigue, stress, and other health-related concerns. The transition to online and hybrid learning environments further reduced opportunities for physical activity and social interaction, making it more difficult for students to develop healthy fitness habits. Traditional school fitness programs also often fail to sustain student interest because they may not align with students' schedules, preferences, and motivational needs.

In response to these challenges, High-Intensity Interval Training (HIIT) has emerged as a promising fitness approach because of its time-efficient structure and ability to improve aerobic fitness within short periods. However, there remains limited research on HIIT-inspired programs specifically designed to address both the physical and psychological well-being of college students in an engaging, adaptable, and student-centered manner. Therefore, this study aims to evaluate a HIIT-inspired fitness program that enhances aerobic capacity, endurance, motivation, and overall well-being while promoting long-term participation in physical activity among college students.

The inspired High Intensity Interval Training fitness program in this study presents a unique opportunity to address the limitations of traditional cardio training programs, such as Tabata and Hyrox, by combining high-intensity exercise with flexibility and accessibility. Unlike conventional programs, this HIIT-inspired approach is safe for all ages and can be done at home, making it suitable for busy college students with varying schedules. The program's versatility allows it to be tailored to individual fitness levels, either with equipment or using bodyweight exercises, ensuring that it remains accessible regardless of available resources. This flexibility and adaptability, along with its potential to improve both aerobic capacity and overall well-being, sets this study apart from traditional fitness programs by offering a sustainable, engaging solution to combat the growing inactivity among college students.

Statement of the problem

This study aimed to evaluate the effectiveness of the FITPULSE Inspired High Intensity Interval Training program in enhancing the aerobic capacity, endurance, motivation, engagement, and overall well-being of college students.

Specifically, this study sought to answer the following questions:

1. What is the pre intervention aerobic capacity and endurance level of the participating college students as measured through the beep test?

2. What is the post intervention aerobic capacity and endurance level of the participating college students after undergoing the 6-week FITPULSE Inspired High Intensity Interval Training program?
3. Is there a significant improvement in the aerobic capacity and endurance of the participating college students before and after the implementation of the FITPULSE Inspired High Intensity Interval Training program?
4. How does participation in the FITPULSE Inspired High Intensity Interval Training program influence students' motivation, engagement, and overall well-being?
5. What are the students' perceptions, challenges, and motivational experiences during their participation in the FITPULSE Inspired High Intensity Interval Training program?
6. What sustainable student-centered fitness enhancement program may be proposed based on the findings of the study?

METHODOLOGY

This study employed a quasi-experimental mixed-method convergent parallel research design, utilizing both quantitative and qualitative approaches to comprehensively assess the effects of a HIIT-inspired fitness program on the aerobic capacity, motivation, and overall well-being of college students. Through this design, quantitative and qualitative data were collected and analyzed concurrently to provide a deeper and more balanced understanding of the participants' physical and psychosocial experiences throughout the intervention. The first two research questions, focusing on the pre- and post-intervention aerobic capacity levels of participating students, were addressed using fitness assessments. Specifically, the beep test was conducted as a reliable and valid measure of aerobic capacity. Participants underwent the beep test both before and after the intervention to quantify any changes in their physical fitness levels. The test provided concrete data to assess the impact of the HIIT-inspired program on participants' aerobic capacity, addressing Research Questions 1 and 2.

To answer Research Questions 3 and 4, which explored the influence of HIIT participation on students' motivation, engagement, and overall well-being, as well as their perceptions, challenges, and motivational factors, focus group discussions (FGDs) were conducted with 15 out of the 30 participants. The FGDs offered qualitative insights into how students perceived the training sessions, what challenges they faced, and the motivational factors that influenced their continued engagement in the program. These discussions also explored how the HIIT program impacted their overall well-being and how it fostered intrinsic motivation, autonomy, and relatedness, in alignment with the principles of Self-Determination Theory (SDT). By gathering rich, narrative data through these FGDs, the study provided deeper understanding beyond the quantitative fitness assessments, addressing the psychosocial aspects of the program.

This mixed-methods approach allowed the researcher to triangulate data from both the fitness assessments and focus group discussions, offering a comprehensive view of the program's effects. The quantitative data revealed changes in physical fitness, while the qualitative data shed light on students' personal experiences and the psychological factors that influenced their motivation and engagement. Together, these methods provided a holistic understanding of the impact of the HIIT-inspired fitness program on college students, informing the development of a sustainable and student-centered fitness enhancement program tailored to the needs and preferences of college students.

Project Development

The development of this project began with the implementation of a validated beep test to measure the aerobic capacity and endurance levels of participating college students. The beep test, a well-established assessment tool, served as the primary method for addressing Research Questions 1 and 2, providing objective pre- and post-intervention data on students' aerobic performance and endurance levels. Students completed the beep test before the HIIT-inspired training program to establish baseline measures and again after completing the program to assess the extent of improvement. The data collected from these assessments were analyzed to determine changes in aerobic capacity and endurance, aligning with the study's objectives to evaluate the effectiveness of the fitness program. The beep test ensured reliable and valid results, contributing to the quantitative aspect of the research design. Additionally, participants underwent a standardized fitness evaluation to further assess their physical fitness levels and progress over the course of the intervention.

To explore the motivational and engagement factors addressed in Research Questions 3 and 4, a researcher-made focus group discussion (FGD) was conducted with the participants. The FGD aimed to gather qualitative data on students' perceptions of the HIIT-inspired fitness program, the challenges they encountered, and the motivational elements that influenced their commitment to the program. The questions in the FGD were designed based on the principles of Self-Determination Theory, focusing on intrinsic motivation, autonomy, and relatedness, and were validated by experts in the field of fitness and psychology to ensure the reliability and relevance of the discussion points. Following the completion of the program, the FGD provided rich insights into how the participants felt during the intervention, how their motivation to engage in physical activity evolved, and what barriers or incentives influenced their behavior. The qualitative findings from the FGD complemented the quantitative data from the beep test, helping to create a comprehensive understanding of the program's impact on students. These insights were used to refine and develop a sustainable, student-centered fitness program tailored to the needs and challenges faced by college students. By combining expert validation of the FGD with the objective fitness assessments, the research aimed to provide a well-rounded perspective on how HIIT-inspired training can enhance both physical fitness and overall well-being in college students.

Operation and Testing Procedure

The operation and testing procedure for this study followed a structured process to assess the impact of the HIIT-inspired fitness program on college students' aerobic capacity, endurance, and well-being. Initially, all thirty IT college student participants underwent a baseline assessment using the validated beep test to measure their aerobic capacity and endurance levels. This pre-test was conducted in a controlled environment, ensuring that all students were given consistent instructions and were familiar with the test protocol. The beep test was performed on the first day of the intervention to establish initial fitness levels, which helped in answering Research Question 1 regarding the pre-intervention aerobic capacity and endurance. Following the baseline assessment, participants engaged in a 6-week FITPULSE HIIT-inspired fitness intervention conducted twice a week, with each session lasting approximately 20 to 30 minutes. The intervention followed a structured three-phase system composed of Adaptation, Progression, and Peak Performance phases to gradually and safely improve participants' cardiovascular endurance and fitness levels.

During Weeks 1 to 2 under the Adaptation Phase, participants performed light to moderate exercises such as Jumping Jacks, High Knees, Mountain Climbers, Fast Feet, and Butt Kicks through two circuits to build foundational endurance and adapt to the high-intensity

format. In Weeks 3 to 4 under the Progression Phase, the intensity increased to moderate and high levels through three circuits consisting of dynamic exercises including Burpees, Jump Squats, Sprint in Place, Speed Skaters, Jump Lunges, and Push Up Rotation to improve cardiovascular demand and muscular endurance. During Weeks 5 to 6 under the Peak Performance Phase, participants completed very high to maximum intensity workouts through four circuits composed of explosive movements such as Burpee Tuck Jumps, Explosive Jump Squats, Sprint Knees, Dynamic Plank Reach, Power Skaters, and Fast Feet with reduced recovery periods to maximize aerobic performance and endurance. The HIIT-inspired fitness program was structured to meet the needs of college students and was aligned with the principles of Self-Determination Theory, emphasizing motivation, autonomy, engagement, progressive overload, and safe exercise participation throughout the sessions.

Upon completion of the intervention, participants underwent a post-test using the beep test to assess any improvements in their aerobic capacity and endurance. The post-test was administered in the same controlled environment under similar conditions as the pre-test, allowing for reliable comparison of results. The data collected from the beep test were analyzed quantitatively to address Research Question 2, focusing on the extent of improvement in students' aerobic performance. Additionally, to gather qualitative insights into the students' experiences, a researcher-made focus group discussion (FGD) was conducted. The FGD explored students' perceptions, challenges, and motivational factors experienced during the training, aligning with Research Questions 3 and 4. The FGD was designed with questions validated by experts, ensuring the reliability of the data collected. All procedures, including pre- and post-assessments and the FGD, were carried out following ethical guidelines, ensuring informed consent, confidentiality, and the protection of participants' well-being throughout the study.

Project Data Analysis

The data analysis for this study employed a systematic approach to evaluate both the quantitative and qualitative data collected throughout the research. For the first two research questions, the results from the pre- and post-intervention beep tests were analyzed using standardized rubrics to assess the improvement in participants' aerobic capacity. The rubrics provided specific criteria for interpreting the beep test scores, ensuring consistency in evaluation. Participants' scores were categorized based on established performance levels for men and women, namely Excellent, Very Good, Good, Average, Poor, and Very Poor. For male participants, scores above 13 were classified as Excellent, 11 to 13 as Very Good, 9 to 11 as Good, 7 to 9 as Average, 5 to 7 as Poor, and below 5 as Very Poor. For female participants, scores above 12 were categorized as Excellent, 10 to 12 as Very Good, 8 to 10 as Good, 6 to 8 as Average, 4 to 6 as Poor, and below 4 as Very Poor.

The scoring process involved recording the final level and beep completed by each participant during the beep test before converting the results into corresponding fitness categories based on the rubric. This procedure allowed the researcher to determine both individual and overall improvements in aerobic performance from the pre-test to the post-test assessments. The paired t-test was used to analyze the quantitative data from the beep tests, comparing the pre- and post-test scores to determine if there was a statistically significant improvement in the participants' aerobic performance after completing the HIIT-inspired fitness program. This method helped address Research Question 2 by providing a clear measure of the extent of improvement in aerobic capacity. The quantitative findings also served as the

basis for evaluating the effectiveness of the 6-week FITPULSE intervention program implemented throughout the study.

For Research Questions 3 and 4, which focused on the students' motivation, engagement, and perceptions, qualitative data were analyzed through thematic coding. The researcher-made focus group discussion (FGD) provided rich textual data, which were transcribed and analyzed to identify recurring themes and patterns related to students' experiences, challenges, and motivational factors during the program. Thematic coding was used to group these responses into themes that reflected the key aspects of motivation, engagement, and overall well-being as outlined in Self-Determination Theory. This qualitative analysis allowed for a deeper understanding of how the HIIT-inspired program influenced students' attitudes toward physical activity and helped address the perceived challenges and factors that motivated them to stay engaged. The findings from this analysis complemented the quantitative data, offering a comprehensive view of the program's impact on college students' fitness and well-being.

Evaluation Procedure

The evaluation procedure for this study was a multi-step process that ensured both the reliability and validity of the findings. Initially, the beep test scores were reviewed and interpreted using standardized rubrics to assess the aerobic capacity and endurance of the students. These rubrics ensured consistent scoring across all participants and pre- and post-test comparisons. To assess improvements, paired t-tests were conducted on the pre- and post-test beep scores, enabling statistical analysis of the data to determine if any significant changes in aerobic performance and endurance occurred. Additionally, the researcher-made focus group discussion (FGD) was evaluated through expert validation, ensuring that the discussion questions were clear, relevant, and aligned with the research objectives. Experts in fitness and psychology reviewed the FGD design to ensure that the questions adequately captured the students' experiences, perceptions, and motivational factors. This strengthened the overall validity of the qualitative component and ensured it contributed meaningful insights to the study.

Once the data collection was complete, the evaluation proceeded with the analysis of both the quantitative and qualitative data. The quantitative analysis of the beep test was interpreted based on the results of the paired t-test to establish any statistically significant improvements in aerobic capacity and endurance. The qualitative data from the FGD underwent thematic coding, and themes were identified through a systematic analysis of the participants' responses. This process allowed for a nuanced understanding of the students' experiences, challenges, and motivations throughout the training program. After the analysis, the results were cross-referenced with the research questions and objectives to ensure that all aspects of the study were addressed. The evaluation procedure concluded with the synthesis of both data types to form a comprehensive understanding of the program's impact, providing valuable insights for the development of a sustainable fitness program for college students.

RESULTS AND DISCUSSION

Pre- and post-intervention aerobic capacity and endurance levels of college students

The results in the table show noticeable changes in the aerobic capacity levels of the female participants after undergoing the HIIT-inspired fitness program. From a pretest mean score of 1.25, the participants achieved a higher posttest mean of 2.31, reflecting improved performance during the beep test after the 6-week intervention. This increase suggests that the

training sessions helped participants gradually adapt to higher levels of physical activity and cardiovascular demand. The standard deviation increased from 1 in the pretest to 2 in the posttest, indicating differences in the rate and extent of improvement among the participants. These variations may reflect individual differences in fitness levels, consistency, physical adaptation, and overall response to the structured HIIT program.

The findings of table 2 and 4 align with Self-Determination Theory (SDT), which emphasizes the importance of supporting psychological needs (autonomy, competence, and relatedness) in fostering intrinsic motivation and sustained engagement in physical activity (Ntoumanis & Moller, 2025). When these needs are met, individuals are more likely to experience intrinsic motivation, leading to better physical and psychological outcomes. As such, the results of this study suggest that the HIIT program, designed to support these basic psychological needs, effectively enhanced both the physical fitness and overall well-being of the students.

Studies have consistently shown that HIIT is an effective way to improve aerobic capacity and promote long-term physical activity engagement. For example, Sun et al. (2025) found that both online and offline HIIT programs significantly enhanced VO_2 max and fostered self-regulatory behaviors, such as sustained participation and self-motivation, among college students. Their research suggests that HIIT can be a powerful tool for not only improving fitness levels but also encouraging intrinsic motivation for continued exercise. The flexibility of HIIT programs, as highlighted by Sun et al. (2025), further supports the notion that adaptable fitness routines can help students maintain consistent exercise habits despite their academic demands.

The key results of this study revealed noticeable improvements in the aerobic capacity levels of both male and female participants after completing the HIIT-inspired fitness program. Male participants demonstrated an increase in mean scores from 1.5 during the pretest to 2.64 in the posttest, while female participants showed an improvement from 1.25 to 2.31, reflecting enhanced aerobic performance following the 6-week intervention. These findings highlight the effectiveness of the structured FITPULSE program in improving cardiovascular fitness through progressive and time-efficient high-intensity exercises tailored to the needs of college students.

The results help address the gap in existing fitness interventions by showing that a structured and adaptable HIIT program can effectively support both male and female students with varying fitness levels. Supporting this outcome, Masangcay et al. (2024) found that incorporating engaging fitness approaches, such as technology-based aerobic routines, improved VO_2 max and encouraged active participation among college students. Similar to those findings, the current study demonstrates that a personalized and progressive HIIT program can provide meaningful improvements in aerobic capacity while maintaining student engagement and participation.

Improvement in aerobic capacity and endurance after the HIIT program

Th results show the extent of improvement in the aerobic capacity and endurance of participating college students after undergoing the inspired High-Intensity Interval Training (HIIT) fitness program. The results reveal that the mean score increased from 1.37 (SD = 1.00) in the pretest to 2.47 (SD = 2.00) in the posttest, indicating an improvement of 1.10 points. The paired samples t-test further indicates that this improvement is statistically significant ($t(29) = -9.90, p < .001$), suggesting that the observed change is unlikely due to chance. Moreover, the computed effect size ($d = -1.81$) indicates a very large extent of improvement, demonstrating that the intervention had a substantial and meaningful impact on the aerobic capacity and

endurance of the participants. The outcomes confirm that the HIIT-inspired fitness program resulted in a significant and large improvement in students' aerobic capacity and endurance.

The results from Table 2 show a significant and substantial improvement in the aerobic capacity and endurance of college students after completing the HIIT program, with a mean score increase of 1.10 points and a very large effect size ($d = -1.81$). This aligns with Self-Determination Theory (SDT), which emphasizes the role of competence in fostering intrinsic motivation; as students experience tangible improvements in their physical abilities, they are likely to feel more competent and motivated to continue engaging in physical activity (Ntoumanis & Moller, 2025).

The outcomes of this study align with the findings of Masagca (2024), who demonstrated that HIIT significantly outperformed low-intensity steady-state training (LISS) in improving aerobic capacity and endurance in a shorter period, making it an effective option for university students facing time constraints. The substantial improvement in aerobic capacity observed in the current study supports the idea that HIIT's high efficiency in boosting cardiovascular health can lead to quick and meaningful fitness gains. Additionally, Yagong and Chavez (2025) highlighted the importance of intrinsic motivation and autonomy in sustaining engagement in physical activity, factors likely enhanced by the HIIT program's focus on competence and self-determined effort. These results suggest that, in addition to its physical benefits, HIIT also fosters the kind of intrinsic motivation that encourages continued participation, further supporting its effectiveness in enhancing both fitness and student engagement.

The key results of this study underscore the substantial improvement in aerobic capacity and endurance, confirming that the HIIT program effectively enhances students' physical fitness. This finding fills a gap by demonstrating how structured high-intensity training can provide significant and measurable benefits in a short period, which is essential for busy college students. Zhong et al. (2024) support this outcome by highlighting that intrinsic motivation, fostered through autonomy-supportive programs like HIIT, leads to positive psychological outcomes, including improved well-being and personal growth. Their research suggests that when students feel empowered and engaged in their physical activities, as seen in this study, they are more likely to experience not only improved fitness but also enhanced mental health, making HIIT an effective tool for both physical and psychological development.

HIIT participation on students' motivation, engagement, and well-being.

The findings presented in the table illustrate the various ways in which participation in the HIIT program influenced students' motivation, engagement, and overall well-being. A key theme that emerged was the sense of autonomy in workout choices, with several participants expressing how the ability to adjust the difficulty of exercises to suit their individual needs made them feel in control and empowered. For instance, Participant 3 shared, "I felt like I was doing it perfectly on my own pace and that I can do the workouts that is right for my body," highlighting the value of having flexibility in the workout. Another important theme was the decision-making opportunities within the program, where participants like Participant 2 felt more confident in their workouts by having the freedom to decide how to finish the exercises at their own level of capability. The effectiveness of the program in enhancing strength, stamina, and aerobic capacity was also emphasized, as Participant 1 mentioned, "I think the program was effective because even though it was short, it was intense enough to build stamina over time," demonstrating that the program's design successfully supported physical improvements.

Additionally, the group dynamics played a significant role in motivating participants, with Participant 1 noting that "collective energy was infectious," showing how the social aspect

of the HIIT program contributed to a sense of community and further fueled motivation. The supportive environment fostered by both the instructor and peers, as noted by Participant 1, who described the instructor's "positive reinforcement" and peer high-fives, highlights the role of relationships in increasing motivation and encouraging sustained engagement in the program.

The findings from this study align with Self-Determination Theory (SDT), which emphasizes how fulfilling psychological needs such as autonomy and competence can foster intrinsic motivation, leading to sustained engagement in physical activity. SDT is particularly suited for this study as it provides a comprehensive framework to understand how motivation influences both physical outcomes and well-being, with previous research showing that SDT-based interventions enhance exercise adherence and long-term engagement in fitness programs (Barbosa Cano, 2025).

Research consistently emphasizes the importance of intrinsic motivation in fostering college students' engagement in physical activity. Yu et al. (2024) highlighted that students who were intrinsically motivated by personal goals and self-improvement not only participated more actively in physical exercise but also exhibited higher self-efficacy. This aligns with the current study, where participants who had the autonomy to adjust their workouts based on their abilities were more motivated and engaged. Additionally, Yu et al. (2024) suggested that creating an enjoyable and supportive environment can enhance students' psychological resilience, which is reflected in the group dynamics and positive relationships observed during the HIIT sessions, ultimately contributing to sustained participation.

The key results of this study emphasize the importance of group dynamics, social support, and autonomy in maintaining student engagement in the HIIT program. By incorporating the flexibility for participants to adjust workouts based on their individual needs, the program created an environment that catered to various fitness levels, fostering sustained participation. This is consistent with Khmara et al. (2021), who highlighted that combining individual, social, and environmental factors enhances the long-term success of fitness programs. Additionally, Wu et al. (2024) found that offering diverse and inclusive activities increases engagement and helps maintain student participation. The findings from this study suggest that a holistic approach, combining autonomy, social support, and group dynamics, can effectively enhance both short-term engagement and long-term sustainability in fitness programs.

Students' perceptions and challenges: Insights for developing a sustainable fitness program.

The findings presented in the table reveal various factors that contribute to students' engagement and motivation in the HIIT program. Participants highlighted the importance of having control over their workouts, with Participant 2 stating, "I felt that I had enough control over my workouts because we could adjust the exercises," which contributed to increased engagement and motivation. The ability to progress at a comfortable pace also played a significant role in sustaining commitment, as evidenced by Participant 1's comment, "The ability to select and adjust repetitions based on my daily energy levels kept me engaged."

Group dynamics were another key factor, with Participant 1 noting that the "group challenges and the visual progress tracking" kept them motivated. Despite some challenges with intensity, like Participant 2's experience of struggling to keep up with the fast pace, the program's flexibility, such as "resting briefly when needed" (Participant 2), and group support helped participants push through difficult moments and stay committed to the program. Suggestions for future programs included incorporating more variety in exercises and adding

competitive elements like a leaderboard to further enhance engagement, as suggested by Participant 1.

The findings support Self-Determination Theory (SDT), which emphasizes that satisfying psychological needs like autonomy, competence, and relatedness boosts intrinsic motivation and leads to sustained engagement in physical activities (Ntoumanis & Moller, 2025). By allowing students to control their workouts, progress at their own pace, and benefit from group support, the HIIT program effectively nurtures these needs. As a result, participants experienced both physical improvements and enhanced well-being, confirming SDT's relevance to this fitness intervention.

The results of this study are supported by research highlighting the barriers students face in engaging with physical activity, particularly related to time constraints and motivation. Puen et al. (2021) found that academic workload and lack of motivation were significant barriers to exercise during the COVID-19 pandemic, which aligns with the need for flexible and engaging fitness programs like HIIT that can be tailored to students' schedules. Similarly, Dagum (2024) identified that time constraints and limited access to fitness facilities discouraged participation, further emphasizing the importance of creating accessible, time-efficient fitness programs that meet students' needs. Both studies suggest that offering adaptable and inclusive programs, such as HIIT, can help overcome these challenges and encourage sustained physical activity among students.

The outcomes from this study demonstrate that students' engagement in the HIIT program was largely driven by their intrinsic motivation and self-regulation, which directly contributed to their sustained participation. Durán Vinagre et al. (2023) found that students who exhibited higher levels of self-regulation were more likely to engage in physical activity consistently, suggesting that intrinsic motivation plays a critical role in maintaining long-term engagement. This aligns with the current findings, where students who felt a sense of autonomy and control over their workouts, like Participant 1, who stated, "The ability to select and adjust repetitions based on my daily energy levels kept me engaged," showed greater commitment. By fostering an environment that emphasizes personal choice and enjoyment, this study fills the gap in understanding how self-regulation and intrinsic motivation can be nurtured in fitness programs to ensure lasting participation.

CONCLUSION

The findings of this study demonstrate that the FITPULSE Inspired High Intensity Interval Training program is an effective intervention for improving the aerobic capacity and endurance of college students. The results revealed noticeable increases in aerobic performance among both male and female participants following the six-week intervention. Male participants improved from a mean pretest score of 1.50 to a posttest score of 2.64, while female participants improved from 1.25 to 2.31. Furthermore, the overall mean score increased from 1.37 to 2.47, with the paired samples t test confirming a statistically significant improvement and a very large effect size. These findings indicate that the structured and progressive HIIT program successfully enhanced the cardiovascular fitness and endurance levels of the participants.

The study further established that participation in the FITPULSE program positively influenced students' motivation, engagement, and overall well-being. Through autonomy supportive activities, self-paced progression, and opportunities for personal decision making, participants developed a stronger sense of competence and confidence in performing physical activities. The program also fostered meaningful social interaction and peer support, which contributed to sustained participation and positive exercise experiences. These outcomes are consistent with the principles of Self Determination Theory, which emphasize the importance

of autonomy, competence, and relatedness in promoting intrinsic motivation and long-term engagement in physical activity.

Moreover, the qualitative findings revealed that students valued the flexibility, accessibility, and adaptability of the program. While some participants experienced challenges related to exercise intensity and physical fatigue, these barriers were effectively addressed through program modifications, supportive group dynamics, and opportunities for self-regulation. The participants likewise recommended incorporating greater exercise variety and additional motivational features to further enhance future implementations of the program.

Overall, the study concludes that the FITPULSE Inspired High Intensity Interval Training program is a practical, engaging, and time efficient fitness intervention that significantly improves aerobic capacity, endurance, motivation, engagement, and well-being among college students. The findings support the adoption of student centered HIIT based fitness programs within higher education institutions as a sustainable strategy for promoting physical fitness, healthy lifestyles, and lifelong participation in physical activity.

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