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# Acute Cognitive and Emotional Benefits of Pound Fit In Young Adult Women

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## ABSTRACT

This study aimed to investigate the acute effects of Pound Fit exercise on cognitive performance, specifically concentration and decision-making, and on positive affect of young adult women. A quasi-experimental design with a one-group pre-test post-test approach was employed, involving 30 female university students aged 18–25 years with normal body mass index (BMI). Participants completed a 45-minute Pound Fit session led by a certified instructor, consisting of warm-up, main exercise, and cool-down phases. Concentration was assessed by using the Stroop Colour and Word Test (SCWT). The positive affect was measured by the Positive and Negative Affect Schedule (PANAS), while decision-making was evaluated by using the Iowa Gambling Task (IGT). All variables were measured before and after the exercise. Data were analysed by using paired t-test and Wilcoxon signed-rank test at a significance level of $\alpha = 0.05$. Results showed significant improvements in all domains, including concentration (median decreased from 147 to 128 seconds; $p = 0.0025$), positive affect (mean increased from 31.3 to 40.4; $p = 0.0001$), and decision-making (median increased from 21.5 to 50; $p = 0.0001$). These findings indicate that a single Pound Fit session can acutely enhance both cognitive and emotional functions in young adult women. Pound Fit may therefore serve as an effective, enjoyable, and non-pharmacological strategy to promote mental fitness among female students.

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## INTRODUCTION

Cognitive and affective functions are essential determinants of academic performance, decision quality, and emotional well-being. Cognitive performance encompasses a range of higher-order processes, including attention, working memory, and decision-making (Basso & Suzuki, 2016). In parallel, emotional states such as the positive affect, including the feeling of enthusiasm, alertness, and joy, play a vital role in psychological resilience and social functioning (Richardson et al., 2016). Among young adult women, fluctuations in estrogen levels can significantly affect these domains, contributing to variations in concentration, mood stability, and cognitive flexibility (Ali et al., 2018).

Medical students, in particular, face heavy academic workloads and psychosocial stressors that often diminish their mood and mental focus (Hill et al., 2018). Data from Indonesia's Basic Health Research revealed that 19 million Indonesians aged 15 years and above experience emotional or mental disorders, with the highest prevalence found in females aged 16–24 years (Riskesdas, 2018). Meanwhile, exercise is a non-pharmacological intervention with proven benefits for both physical and mental health. For example, the High-Intensity Interval Training (HIIT) has been shown to increase cerebral blood flow, neurotransmitter release (serotonin, dopamine, endorphins), and brain-derived neurotrophic factor (BDNF) that could enhance attention, decision-making, and moods (Dasso, 2019; Guan et al., 2024).

Pound Fit, a rhythm-based HIIT workout that integrates elements of drumming, Pilates, and cardio movements, offers a multisensory stimulation through auditory and kinaesthetic pathways (Fanani et al., 2025). Therefore, pound fit is assumed to be able to produce acute cognitive and emotional benefits due to its combined physical and rhythmic stimulation effects. However, only a few of empirical studies have examined its immediate impact on multiple psychological domains simultaneously. For this reason, this study aimed to determine the acute effects of Pound Fit exercise on the concentration, positive affect, and decision-making of young adult women to provide novel insights into its potential as a mental fitness intervention.

While previous studies have demonstrated the cognitive and emotional benefits of the general High-Intensity Interval Training (HIIT), empirical evidence specifically examining the acute impact of Pound Fit as a rhythm-based HIIT exercise combining music, coordination, and full-body movements on concentration, positive affect, and decision-making remains scarce. This research is the first study that simultaneously evaluates these three domains in young adult women, providing novel insights into the immediate psychophysiological benefits of Pound Fit as a music-integrated HIIT intervention.

## METHODS

### Design and Participants

This research adopted a quasi-experimental one-group pre-test post-test design conducted at the Sukamekar Sports Hall, Bandung, with the data analysis performed at the Faculty of Medicine, Maranatha Christian University, from January to December 2024.

Thirty female students aged 18–25 years with a normal BMI (18.5–22.9 kg/m$^2$) were recruited through a consecutive sampling. The inclusion criteria included physically and mentally healthy, not performing Pound Fit regularly, and willing to complete all of the study procedures with informed consent. The exclusion criteria involved a history of musculoskeletal disorders, the use of psychoactive medication, alcohol consumptions, and

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having menstruation during the study. The ethical approval was obtained from the Maranatha Christian University Research Ethics Committee (No. 099/KEP/VII/2024).

**Instruments**

The instruments of this study included the Stroop Colour and Word Test (SCWT) to measure concentration, the Positive and Negative Affect Schedule (PANAS) by Watson et al. (1988) to assess positive affect, and the Iowa Gambling Task (IGT) to evaluate decision-making.

**Procedure**

Participants first completed pre-test assessments (SCWT, PANAS, IGT). The intervention consisted of a 45-minute Pound Fit session led by a certified instructor, including warm-up (5 min), main activity (35 min), and cool-down (5 min). Music-driven rhythmic movements were performed using *Ripstix* drumsticks in the group format. After a 10-minute rest period, participants repeated all post-test measures using the same instruments.

**Data Analysis**

The normality of the data was tested by using the Shapiro–Wilk test. Differences between pre-test and post-test scores were analysed by using the paired t-test (for normal distributions) and the Wilcoxon signed-rank test (for non-normal distributions), with the significance level set at $\alpha = 0.05$. Analyses were performed by using SPSS version 29.

## RESULTS

**Participant Characteristics**

A total of 30 female university students aged 20–22 years participated in this study. The majority (76.7%) were 21 years old, while other 10% and 13.3% were 20 years and 22 years consecutively. Most participants (83.3%) reported not engaging in a regular physical activity prior to the study, while 16.7% of them were categorized as regular exercisers. All participants met the inclusion criteria and completed the intervention and post-test assessments without dropouts.

**Effects of Pound Fit on Concentration**

Concentration levels were assessed by using the Stroop Color and Word Test (SCWT) before and after a single 45-minute Pound Fit session. The data distribution was not normal (Shapiro–Wilk $p < 0.05$). Therefore, the Wilcoxon signed-rank test was applied. The median SCWT completion time significantly decreased from 147 seconds (range: 115–253) before the exercise to 128 seconds (range: 108–262) after the exercise ($p = 0.0025$). A shorter completion time indicates improved focus and reduced Stroop interference.

These findings demonstrate a substantial acute enhancement of the selective attention and cognitive control following the Pound Fit. The improvement aligns with prior studies reporting that brief aerobic exercise sessions (15–45 minutes) could significantly boost attention and executive functions through the increased cerebral blood flow and dopaminergic activation (Kleinloog et al., 2019; Liu et al., 2023).

**Effects of Pound Fit on Positive Affect**

Positive affect was measured by using the Positive and Negative Affect Schedule (PANAS). Data were normally distributed ($p > 0.05$), allowing a paired t-test for the analysis.

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The positive affect mean score increased from 31.3 ± 7.25 before the exercise to 40.4 ± 5.83 afterward, indicating a statistically significant improvement (p = 0.0001).

This enhancement reflects a notable uplift in the emotional state and energy immediately following the Pound Fit. The results are consistent with previous research demonstrating that the aerobic exercise combined with a rhythmic music promotes endorphin release, reduces cortisol levels, and enhances social bonding during group workouts (Fadare et al., 2024; Tan & Dinçer Hekim, 2024). Participants reported that they felt more enthusiastic, inspired, and confident after the session.

**Effects of Pound Fit on Decision-Making**

Decision-making ability was assessed by using the Iowa Gambling Task (IGT). The data were not normally distributed (Shapiro–Wilk $p < 0.05$). The Wilcoxon signed-rank test analysis showed a highly significant increase in decision-making scores after the intervention. The median score rose from 21.5 (range: 13–33) before the exercise to 50 (range: 29–61) after the exercise (p = 0.0001).

This improvement indicates an enhanced risk evaluation, feedback integration, and cognitive flexibility. Physiologically, this may relate to the increased dopaminergic and serotonergic neurotransmission due to the heightened cardiovascular activity during Pound Fit, which promotes prefrontal cortex engagements in decision-making processes (Gorrell et al., 2022; Heijnen et al., 2016).

**Table 1. Effects of Pound Fit on Cognitive and Emotional Outcomes**

| Variable | Pre-Test (Mean/Median) | Post-Test (Mean/Median) | p-value | Interpretation |
|---|---|---|---|---|
| Concentration (SCWT) | 147 sec (median: 115–253) | 128 sec (median: 108–262) | 0.0025 | Significant improvement |
| Positive Affect (PANAS) | 31.3 ± 7.25 | 40.4 ± 5.83 | 0.0001 | Highly significant increase |
| Decision-Making (IGT) | 21.5 (median: 13–33 ) | 50 (median: 29–61) | 0.0001 | Highly significant improvement |

Overall, one session of Pound Fit elicited acute improvements across cognitive and emotional domains. Participants showed faster information processing (shorter Stroop latency), greater positive affect, and improved decision-making performance. These multidimensional benefits may result from the synergistic combination of rhythmic auditory stimulation, physical exertion, and synchronized group movements that activate neural pathways related to attention, emotion regulation, and executive control. The findings underscore the potential of Pound Fit as an effective music-based aerobic activity for enhancing mental fitness and cognitive vitality among young adult women.

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## DISCUSSION

The present study demonstrated that a single 45-minute Pound Fit session produced significant acute improvements in concentration, positive affect, and decision-making among young adult women. These findings reinforce existing evidence that acute bouts of a structured physical activity, particularly those with rhythmic and group-based components, can positively influence both cognitive and emotional domains.

### Cognitive Enhancement through Acute Exercise

The improvement in concentration observed in this study, reflected by shorter Stroop test completion times, supports prior research showing that acute exercise could enhance executive attention and cognitive control. The mechanism is primarily attributed to the increased cerebral blood flow and oxygen delivery to the prefrontal cortex, a brain region responsible for selective attention, inhibitory control, and working memory (Alves et al., 2014; Zhang et al., 2025). Additionally, acute bouts of physical exercise have been shown to transiently elevate levels of catecholamines (such as dopamine and norepinephrine) and facilitate executive functions including cognitive flexibility and attention in humans (Cai et al., 2025; Hou et al., 2024).

During Pound Fit, participants performed repetitive upper and lower body movements in synchronization with rhythmic music. This combination likely activated both motor and auditory cortices, stimulating cross-modal neural networks that facilitate attentional engagement and reaction time efficiency. The involvement of music may also promote entrainment, a neural synchronization phenomenon that aligns internal brain rhythms with external beats, thereby optimizing cognitive focus during and after the exercise (Tan & Dinçer Hekim, 2024).

### Mood Regulation and Emotional Uplift

A significant increase in the positive affect following Pound Fit is consistent with previous studies reporting that rhythmic group exercises could induce endorphin-mediated euphoria and social bonding. The mechanism involves the release of β-endorphins, serotonin, and dopamine, which collectively reduce stress perceptions and elevate moods (Fadare et al., 2024). Moreover, music-based group interactions foster affective experiences and social belonging, supporting emotional regulation through synchronized rhythms and movements (Wang et al., 2025). Group cohesion during the session likely contributed to the observed emotional benefits by creating an atmosphere of shared enjoyment and motivation, the factors that are shown to amplify the exercise-induced mood enhancement (Gorrell et al., 2022; Guan et al., 2024).

These outcomes suggest that Pound Fit is not only a physical exercise but also a psychosocial intervention which is capable of reducing tensions and promoting the positive affect through a multimodal engagement of the body and mind.

### Improved Decision-Making and Executive Function

The significant increase in the decision-making performance measured by the Iowa Gambling Task indicates an improved executive function, risk evaluation, and adaptive reasoning after the exercise. This aligns with studies demonstrating that even a single session of high-intensity or rhythmic exercise can improve prefrontal cortical efficiency, thereby enhancing the ability to weigh consequences, process feedbacks, and make optimal choices (Basso & Suzuki, 2016).

From a neurobiological perspective, these effects may result from increased Brain-Derived Neurotrophic Factor (BDNF) levels, which enhance synaptic plasticity and information processing. The combination of physical exertions and music-driven rhythms in Pound Fit potentially amplifies neural excitations in the orbitofrontal cortex and anterior cingulate

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gyrus, the regions essential for integrating emotion and decision-making (Guan et al., 2024; Liu-Ambrose, 2017). Additionally, the exercise-induced activation of the sympathoadrenal system (release of epinephrine and norepinephrine) improves reaction time and cognitive appraisal by modulating arousal and attentional readiness (Kleinloog et al., 2019). These acute neurochemical changes contribute to the superior post-exercise decision-making outcomes observed in this study (Guan et al., 2024).

**Practical Implications**

From an applied perspective, these results highlight the potential of Pound Fit as an accessible and enjoyable mental health intervention for young women. Incorporating rhythmic group exercises into university wellness programs could help improve focus, emotional stability, and cognitive decision-making as the skills essential for academic success and daily life functioning. Furthermore, Pound Fit combination of aerobic conditioning, rhythmic stimulation, and social interaction may render a more sustainable and appealing exercise than traditional exercise modalities.

**Limitations and Future Directions**

Despite promising outcomes, this study was limited by its one-group pre-test post-test design, which lacks a control group to isolate confounding factors such as motivation or expectation effects. Additionally, the sample size was modest and limited to female medical students, reducing the generalizability. Future studies should employ randomized controlled trials with larger and more diverse populations to measure physiological biomarkers (such as BDNF, cortisol, and heart rate variability) and examine dose-response effects of multiple Pound Fit sessions to validate and expand upon these findings.

## CONCLUSION

In summary, the acute engagement in Pound Fit yielded measurable improvements across all key domains, including concentration, positive affect, and decision-making, suggesting that the rhythmic high-intensity group exercise represents a powerful and enjoyable form of cognitive-emotional enhancement for young adult women.

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## AUTHORS' NOTE

The authors declare that there is **no conflict of interest** regarding the publication of this article. The authors confirm that this paper is **free from plagiarism** and represents original work conducted by the research team.

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