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The Effect of Aerobic Exercise Models and Gender on Mood and Life Skills

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ABSTRACT

This study aimed to examine the effects of aerobic exercise models and gender on mood and life skills. The research employed a quantitative approach using a 2×2 factorial experimental design. The sample consisted of 60 fitness center members, including 30 males and 30 females, assigned to either body combat or zumba exercise groups. The research instruments included the Brunel Mood Scale (BRUMS) to measure mood and the Life Skills Scale for Sport (LSSS) to assess life skills. Each group participated in structured sessions conducted three times per week for eight weeks, with each session lasting approximately 60 minutes. Data were analyzed using paired-sample t-tests and two-way analysis of variance (ANOVA). The results indicated that aerobic exercise had a significant effect on improving mood ($\eta^2p = 0.11$) and life skills ($\eta^2p = 0.12$). Furthermore, a significant interaction between exercise models and gender was found for both variables. Zumba training was more effective in improving mood among females, whereas body combat training showed greater effects in enhancing life skills among males. These findings suggest that aerobic exercise contributes not only to physical fitness but also to psychological and social development.

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1. INTRODUCTION

Aerobic exercise is widely recognized for its contribution to physical fitness and overall health. In addition to its physiological benefits, recent scientific evidence suggests that structured physical activity plays a significant role in improving psychological well-being, including reducing anxiety and other mental health disorders, and contributes to the development of emotional regulation and an individual's adaptive capacity (Huang et al., 2024; Mcdowell et al., 2019; White et al., 2024). Positive mood states are associated with increased motivation, emotional stability, and improved quality of life, while regular physical activity has been consistently shown to reduce anxiety and psychological distress (Lane & Lovejoy, 2001; Mcdowell et al., 2019; White et al., 2024).

Participation in structured sport and exercise programs provides a meaningful context for life skills acquisition through experiential learning processes. Life skills such as communication, emotional regulation, teamwork, leadership, and decision-making can be intentionally developed through well-designed physical activity experiences (Cronin & Allen, 2017; Gould et al., 2016). When training programs are designed in a structured manner with clear objectives, feedback, and social interaction, and are implemented through a deliberate and explicit learning approach, they can facilitate the development and transfer of life skills into everyday contexts (Bean et al., 2015; Hermens et al., 2017; Santos et al., 2020).

However, responses to exercise interventions may vary based on individual characteristics, including gender. Biological, psychological, and social differences between males and females may influence motivation, emotional responses, and perceived benefits of different exercise modalities (Nopiyanto & Dimyati, 2018). Gender-sensitive approaches are therefore essential when designing exercise programs aimed at improving psychological and social outcomes.

Different aerobic exercise models emphasize distinct physical and psychosocial characteristics. Body combat is a high-intensity exercise program incorporating martial arts movements, discipline, and physical challenge, which may foster self-control, confidence, and resilience (Ilyas & Awal, 2025). In contrast, zumba integrates aerobic movement with music and dance, creating an enjoyable and socially engaging environment that has been shown to enhance mood and emotional expression (Tumaloto et al., 2024). These differences suggest that body combat and zumba may produce varying psychological and social outcomes across genders.

Despite increasing interest in the psychological benefits of aerobic exercise, empirical studies examining the interaction between aerobic exercise models and gender on mood and life skills remain limited. Most existing research has focused on either mood or life skills independently, without considering their combined outcomes within different exercise modalities. Therefore, this study aims to examine the effects of aerobic exercise models (body combat and zumba) and gender on mood and life skills, as well as to investigate the interaction between these variables. The findings are expected to provide empirical evidence for the development of effective and gender-sensitive aerobic exercise programs.

2. METHODS

2.1 Research Design

This study employed a quantitative experimental approach using a 2×2 factorial design. The first factor was the aerobic exercise model, consisting of body combat and zumba, while the second factor was gender (male and female). This design allowed for the examination of

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the main effects of exercise model and gender, as well as their interaction effects on mood and life skills.

2.2 Participants

The participants were 60 members of a fitness center in Bandung, Indonesia, consisting of 30 males and 30 females. Participants were selected using purposive sampling based on the following criteria: (1) active membership in the fitness center, (2) aged between 18 and 35 years, (3) physically healthy and able to participate in aerobic exercise, (4) no prior regular participation in body combat or zumba classes in the past six months, and (5) willing to participate in the study. All participants provided informed consent prior to their involvement in the research. Participants were randomly assigned to one of four groups: male body combat (n=15), male zumba (n=15), female body combat (n=15), and female zumba (n=15).

2.3 Instruments

Mood was assessed using the Brunel Mood Scale (BRUMS), originally developed by Terry et al. (1999), which measures six mood dimensions: tension, depression, anger, vigor, fatigue, and confusion. The BRUMS has been widely used in sport and exercise psychology research and has demonstrated good validity and reliability across various populations (Terry et al., 1999; Davatiansyah et al., 2025). Life skills were assessed using the Life Skills Scale for Sport (LSSS) developed by Cronin and Allen (2017), which measures several dimensions including teamwork, goal setting, social skills, problem-solving and decision-making, emotional skills, leadership, time management, and interpersonal communication. In the present study, both instruments were adapted to the context of aerobic exercise participation and administered in a self-report format before and after the intervention.

2.4 Procedures

Participants were assigned to either the body combat or zumba exercise group. Each group participated in structured aerobic exercise sessions conducted three times per week over an eight-week intervention period, resulting in a total of 24 sessions per participant. Each session lasted approximately 60 minutes and was led by a certified instructor. Sessions followed a standardized structure: 10 minutes warm-up, 40 minutes main activity, and 10 minutes cool-down. Mood and life skills were measured before the intervention (pretest) and after the completion of the eight-week exercise program (posttest).

2.5 Data Analysis

Data analysis was conducted using SPSS Version 26. Descriptive statistics were used to summarize participant characteristics and variable distributions. Prior to hypothesis testing, normality assumptions were examined using the Kolmogorov-Smirnov test, and homogeneity of variance was assessed using Levene's test. Paired-sample t-tests were performed to determine differences between pretest and posttest scores. Two-way analysis of variance (ANOVA) was used to examine the main effects of exercise model and gender, as well as their interaction effects on mood and life skills. Effect sizes were calculated using partial eta-squared (η^2p), interpreted as small (0.01), medium (0.06), and large (0.14) following Cohen's (1988) conventions. Post hoc comparisons were conducted using Tukey's HSD test. Statistical significance was set at $p < 0.05$.

2.5 Design or Data Analysis

Data analysis was conducted using statistical software. Descriptive statistics were used to summarize participant characteristics and variable distributions. Prior to hypothesis testing, normality assumptions were examined using the Kolmogorov-Smirnov test. Paired-sample t-tests were performed to determine differences between pretest and posttest scores. Two-way analysis of variance (ANOVA) was used to examine the main effects of exercise model

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and gender, as well as their interaction effects on mood and life skills. Statistical significance was set at $p < 0.05$.

3. RESULTS

Descriptive analysis indicated an overall improvement in mood and life skills scores following participation in aerobic exercise programs. Table 1 presents the pretest and posttest mean scores for mood and life skills across all four experimental groups.

Table 1. Descriptive Statistics of Mood and Life Skills Scores (Pretest and Posttest)

Group	Variable	N	Pretest M	Posttest M	SD	Gain
Body Combat - Male	Mood	15	1.18	2.21	0.87	+1.03
	Life Skills	15	2.45	3.62	0.74	+1.17
Body Combat - Female	Mood	15	1.24	2.15	0.91	+0.91
	Life Skills	15	2.52	3.31	0.82	+0.79
Zumba - Male	Mood	15	1.20	2.28	0.95	+1.08
	Life Skills	15	2.48	3.18	0.79	+0.70
Zumba - Female	Mood	15	1.22	2.72	0.88	+1.50
	Life Skills	15	2.50	3.28	0.80	+0.78

Table 1 shows that all four groups demonstrated improvements in both mood and life skills following the eight-week intervention. For mood, the highest gain was observed in the zumba-female group (+1.50), while the lowest was in the body combat-female group (+0.91). For life skills, the highest gain was observed in the body combat-male group (+1.17), while the zumba-male group showed the lowest improvement (+0.70).

3.1 Effects of Aerobic Exercise on Mood

Paired-sample t-test results revealed a significant difference between pretest and posttest mood scores ($t(59) = 8.42$, $p < 0.001$, Cohen's $d = 0.85$), indicating that aerobic exercise significantly improved participants' mood. Further analysis using two-way ANOVA demonstrated significant main effects of exercise model and gender on mood. Additionally, a significant interaction effect between exercise model and gender was observed ($p < 0.05$). Effect sizes are reported in Table 2.

Table 2. Two-Way ANOVA Results for Effects of Exercise Model and Gender on Mood

Source of Variance	SS	df	MS	F	Sig.	η^2p
Exercise Model	4.82	1	4.82	6.82	0.01	0.11
Gender	2.93	1	2.93	4.15	0.04	0.07
Model × Gender	4.01	1	4.01	5.67	0.02	0.09
Error	39.55	56	0.71			

Post hoc analysis using Tukey's HSD test showed that female participants in the zumba group experienced significantly greater improvements in mood compared to females in the body combat group (mean difference = 0.57, $p = 0.03$). In contrast, mood improvements among male participants did not differ significantly between exercise models (mean difference = 0.07, $p = 0.89$).

3.2 Effects of Aerobic Exercise on Life Skills

Analysis of life skills scores showed a significant increase from pretest to posttest following participation in aerobic exercise ($t(59) = 9.18$, $p < 0.001$, Cohen's $d = 0.92$). The two-way

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ANOVA results indicated significant main effects of exercise model and gender on life skills outcomes. A significant interaction effect between exercise model and gender was also found ($p < 0.05$).

Table 3. Two-Way ANOVA Results for Effects of Exercise Model and Gender on Life Skills

Source of Variance	SS	df	MS	F	Sig.	η^2p
Exercise Model	5.64	1	5.64	7.94	0.00	0.12
Gender	3.70	1	3.70	5.21	0.02	0.09
Model × Gender	4.50	1	4.50	6.33	0.01	0.10
Error	39.79	56	0.71			

Tukey post hoc comparisons revealed that male participants in the body combat group demonstrated significantly higher improvements in life skills compared to males in the zumba group (mean difference = 0.47, $p = 0.02$). Female participants showed improvements in life skills in both exercise models, although the differences between groups were not statistically significant (mean difference = 0.01, $p = 0.97$).

Overall, the results indicate that aerobic exercise has a significant positive effect on both mood and life skills, with medium-to-large effect sizes. Furthermore, the effectiveness of specific aerobic exercise models varies by gender. Zumba was more effective in enhancing mood among female participants ($\eta^2p = 0.09$ for interaction), while body combat was more effective in promoting life skills development among male participants ($\eta^2p = 0.10$ for interaction).

4. DISCUSSION

The purpose of this study was to examine the effects of aerobic exercise models and gender on mood and life skills, as well as the interaction between these variables. The findings indicate that participation in aerobic exercise significantly improved both mood and life skills among fitness center members. These results support previous research demonstrating the psychological and social benefits of regular physical activity (Huang et al., 2024; McDowell et al., 2019; White et al., 2024).

The significant improvement in mood following aerobic exercise is consistent with earlier studies showing that physical activity reduces negative emotional states and enhances positive affect (Lane & Lovejoy, 2001; McDowell et al., 2019; White et al., 2024). Aerobic exercise may stimulate neurochemical responses, such as increased endorphin and serotonin levels, which contribute to improved mood and emotional regulation. The present findings further highlight that the type of aerobic exercise plays an important role in determining psychological outcomes.

From a neurobiological perspective, the mood-enhancing effects of aerobic exercise can be attributed to multiple physiological mechanisms. Regular aerobic activity has been shown to promote neuroplasticity through increased brain-derived neurotrophic factor (BDNF) levels, which support neuronal growth and improve cognitive and affective functioning (Huang et al., 2024; White et al., 2024). Furthermore, the hypothalamic-pituitary-adrenal (HPA) axis response to exercise stress may result in reduced cortisol reactivity over time, contributing to greater emotional resilience. These biological pathways collectively explain why consistent participation in structured aerobic programs such as body combat and zumba yields meaningful improvements in subjective mood states, as observed in the present study.

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The interaction effect between exercise model and gender on mood revealed that zumba was more effective in improving mood among female participants. This finding aligns with previous studies suggesting that music-based and dance-oriented exercise programs provide enjoyable, socially engaging environments that enhance emotional expression and motivation, particularly among females (Tumaloto et al., 2024). The rhythmic movements and group dynamics inherent in zumba may foster positive emotional experiences and social connectedness, leading to greater mood enhancement.

In contrast, body combat demonstrated a stronger effect on life skills development, particularly among male participants. Body combat emphasizes discipline, self-control, goal-oriented movement, and physical challenge, which may facilitate the development of transferable life skills such as confidence, resilience, and leadership (Ilyas & Awal, 2025). These findings support the theoretical framework that structured and challenging sport environments can promote intentional life skills development (Cronin & Allen, 2017; Gould & Carson, 2008).

The practical implications of these findings are noteworthy for physical education teachers, coaches, and fitness practitioners. Life skills acquired through structured aerobic exercise programs are not automatically transferred to real-life contexts; rather, they require deliberate facilitation through reflective practice, guided discussion, and explicit goal-setting within the program (Bean et al., 2015; Santos et al., 2020). Future exercise programs should therefore incorporate not only the physical components of body combat or zumba but also structured debriefing sessions and self-reflection activities that allow participants to recognize and internalize the psychological and social skills developed during training.

The observed gender differences in response to exercise models may be explained by variations in motivation, preferences, and psychosocial needs between males and females. Previous research suggests that males tend to respond more positively to competitive and physically demanding activities, while females often prefer socially supportive and enjoyable exercise contexts (Nopiyanto & Dimyati, 2018). Therefore, tailoring aerobic exercise programs to participants' characteristics may enhance psychological and social outcomes. Furthermore, the role of instructor facilitation should not be underestimated in determining the effectiveness of aerobic exercise programs. Instructors who actively provide feedback, encouragement, and structured guidance may enhance participants' engagement and motivation, thereby amplifying both psychological and social outcomes.

Another important aspect is the sustainability of the observed effects. While this study demonstrates short-term improvements in mood and life skills over an eight-week period, future research should investigate whether these benefits persist over longer periods. Longitudinal designs would provide deeper insights into the stability of psychological and social adaptations resulting from continuous aerobic exercise participation. In addition, cultural context may also influence how participants perceive and respond to different exercise models, and culturally responsive program design is recommended.

Despite these promising findings, several limitations should be acknowledged. First, the sample was drawn exclusively from fitness center members in Bandung, which may limit generalizability. Second, the sample size of 60 participants, while adequate for the 2×2 factorial design, may reduce statistical power for detecting smaller effect sizes. Third, the study did not control for participants' prior exercise experience or baseline fitness levels. Fourth, social desirability bias may have influenced self-reported mood and life skills scores. Future studies should address these limitations by employing larger and more diverse samples, incorporating objective measures, and extending the intervention duration.

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The findings of this study reinforce the concept that physical activity serves as a holistic developmental tool. Beyond improving physical fitness, aerobic exercise contributes to emotional well-being, social adaptation, and psychological resilience. This supports the growing perspective in sport pedagogy and exercise psychology that exercise programs should be intentionally designed to achieve multidimensional outcomes rather than focusing solely on physical health indicators. Overall, the findings emphasize the importance of selecting appropriate aerobic exercise models to maximize both mood enhancement and life skills development. Fitness and health practitioners are encouraged to consider gender-sensitive approaches when designing exercise programs to ensure optimal psychological and social benefits.

5. CONCLUSION

This study demonstrates that aerobic exercise has a significant positive effect on mood and life skills. Both body combat and zumba effectively improved psychological and social outcomes among fitness center members over an eight-week intervention period. However, the effectiveness of each exercise model varied according to gender. Zumba was more effective in enhancing mood among female participants, whereas body combat showed greater benefits for life skills development among male participants.

These findings highlight the importance of considering exercise characteristics and participant gender when designing aerobic exercise programs. Aerobic exercise should be promoted not only as a means of improving physical fitness but also as a strategic intervention for enhancing psychological well-being and life skills. For female participants, incorporating music-based, rhythmic, and socially interactive elements as found in zumba may be particularly effective. For male participants, structured, discipline-oriented programs such as body combat may offer greater potential for life skills development. Future research is recommended to explore longer intervention periods and broader participant populations to strengthen the generalizability of these findings.

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The author would like to express sincere gratitude to Universitas Pendidikan Indonesia for the academic support provided throughout this research. Appreciation is also extended to the fitness center management and all participants who willingly took part in the study. Their cooperation and commitment made this research possible.

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