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The Effect of Step-Aerobic Participation on Exercise Motivation, Coping with Stress, and Happiness Levels: A Quasi-Experimental Study

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Original Article
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Abstract

This study aims to examine the effects of a step-aerobic exercise program on university students exercise motivation, stress coping skills, and levels of happiness through a quasi-experimental approach within the framework of quantitative research methods. The sample of the study consists of 35 university students aged between 20 and 24, who were divided into experimental and control groups. While participants in the experimental group engaged in step-aerobic exercises accompanied by music twice a week for eight weeks, no intervention was applied to the control group. Valid and reliable scales measuring health-based exercise motivation, stress coping, and happiness levels were used as data collection tools. Data were gathered through pre-test and post-test applications, and statistical analyses were conducted using appropriate parametric and non-parametric tests based on the distribution of normality. The findings revealed that the eight-week step-aerobic program led to a statistically significant increase in the experimental group's exercise motivation and stress coping levels. Although there was a significant improvement in happiness within the experimental group, the difference between the groups was not statistically significant. These results indicate that step-aerobic exercises support not only physical but also psychological functioning. In particular, the combination of a group environment, musical structure, and rhythmic movements was found to enhance individuals' intrinsic motivation and positively influence their stress coping strategies. Based on these findings, it is recommended that music-based group exercises such as step-aerobics be integrated into student support programs to promote the psychological well-being of university students.
Keywords: Step aerobics, Group based exercise, University students

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INTRODUCTION

Cardiovascular diseases, diabetes, and obesity are known to increase morbidity and mortality rates (Duncan et al., 2023), and physical activity is widely regarded as an important tool in combating these conditions (Ding et al., 2024; Jin et al., 2024). Notably, the physical activity targets recommended for these purposes are designed to be accessible to everyone. For instance, Sheng et al., (2021) found an inverse relationship between step count and cardiovascular mortality. This finding suggests that even low-intensity walking can have beneficial effects on undesirable health outcomes. Furthermore, the literature indicates that physical activity has the potential to improve mental health, maintain well-being, and prevent symptoms of psychological disorders such as depression and anxiety (Maugeri et al., 2020). However, Tarp et al., (2024) reported low levels of physical activity among individuals today, including university students in the young adult population, due to various reasons. A study involving Chinese university students revealed that physical activity levels were low among young adults aged 18–21 (Wang et al., 2017). Meeting physical activity needs is known to yield numerous positive health outcomes, such as improved physical fitness, weight loss, enhanced self-confidence, increased motivation, and emotional balance (Bao et al., 2020; Ekelund et al., 2024). Therefore, developing innovative and engaging strategies to promote physical activity among young adults is crucial for overcoming potential mental, physical, and emotional challenges (Tan et al., 2025).

Individuals may be motivated to exercise for various reasons; thus, exercise participation goals and motivation differ from person to person, and not everyone derives the same satisfaction from the same type of exercise. According to Brunet and Sabiston (2011), motivation is a factor that helps individuals initiate or maintain behavior. When evaluated through the lens of Self-Determination Theory (Deci & Ryan, 2000), the initiation and regulation of behavior are based on four fundamental factors: Firstly, intrinsic motivation involves the pursuit of personally meaningful goals. Identified regulation refers to engaging in activities that individuals perceive as aligned with their personal goals and values. External regulation, on the other hand, is driven by the pursuit of external rewards or the avoidance of punishment. Lastly, amotivation is characterized by a lack of intention and minimal motivation. While intrinsic motivation and identified regulation reflect higher levels of self-determined motivation, which are generally associated with positive outcomes, external regulation and amotivation represent lower levels of motivation that are often linked to negative outcomes (Ning et al., 2015; Tan et al., 2025). Simply put, students who are intrinsically motivated, that is, who engage in activities for enjoyment or personal satisfaction, are more likely to participate and persist in those activities (Guay et al., 2000). Therefore, participation in exercise programs that promote mental, physical, and social well-being is especially important for university students who are undergoing education and face daily life adaptation and future concerns, supporting their holistic development. Since step aerobics is considered as a physical activity easily performed by anyone, examining its psychological effects on university students is deemed significant.

Step aerobics is an exercise dance easily accessible for individuals aiming to improve physical fitness, performed through regular rhythmic movements. This type of exercise provides an enjoyable experience while increasing musculoskeletal strength, accelerating fat burning, and promoting mental relaxation (Akyol & Semiz, 2020; Park & Jee, 2022). Moreover, step aerobics combines aerobic dance movements with steps performed on a specially designed platform, forming choreographies that integrate different movement patterns. The choreography is repeated several times with music to achieve an aerobic effect, and it is expected to positively influence individuals' psychological well-being by allowing them to have fun (Kurt et al., 2011).

Literature suggests that participation in step aerobics yields beneficial effects not only on physical markers (Chien et al., 2000; Toskovic et al., 2004) but also on psychological states such as reduced stress levels and increased happiness (Ayhan & Yalçınkaya, 2023). For example, Park and Jee (2022) demonstrated that rhythmic step training accompanied by music improved attention, verbal memory, and cognitive control in adolescents, alongside enhancing their mood. Similarly, Dutto et al., (2022) reported that step aerobics reduced stress levels and significantly increased life satisfaction and happiness among middle-aged individuals. A review of related literature reveals that most research on step aerobics focuses on physical fitness parameters (Kurşun et al., 2016), quality of life (Dutto et al., 2022), and body composition (Kodzoman et al., 2024; Mischenko et al., 2024), while only a limited number of studies address stress and happiness (Akyol and Semiz, 2020). The few existing studies have mainly utilized correlational designs without experimental validation. Moreover, most research has been conducted on sedentary middle-aged women, representing another limitation of the literature (Deshpande et al., 2021; Dutto et al., 2022; Kodzoman et al., 2024). The predominance of studies on women may be due to societal tendencies for women to participate more frequently in aerobic dance, step aerobics, and Zumba exercises. Considering these limitations, the present study aims to experimentally examine previously unexplored health-related exercise motivation, stress coping, and happiness among male and female university students participating in a step aerobics program. Therefore, the purpose of this study is to experimentally investigate the exercise motivation, stress coping, and happiness levels of university students who have participated in an 8-week step aerobics course. The hypotheses tested in the study are as follows:

H_0: There is no significant difference in pre-test and post-test scores of exercise motivation, stress coping, and happiness levels in the experimental group participating in the 8-week step aerobics course.

H_1: Individuals participating in step aerobics will have higher exercise motivation levels compared to those who do not participate.

H_2: Individuals participating in step aerobics will have higher stress coping levels compared to those who do not participate.

H_3: Individuals participating in step aerobics will have higher happiness levels compared to those who do not participate.

H_4: Regular participation in an 8-week step aerobics program will significantly increase exercise motivation, stress coping, and happiness levels in the experimental group.

METHOD

Research Model

The study employed a quantitative, quasi-experimental design with a control group and pre-test/post-test measurements. Quantitative research involves testing a defined problem using theories, measurement through numerical data, and analysis with statistical techniques. Experimental research refers to the evaluation of independent variables through manipulation, with participants randomly assigned and all other conditions held constant. The primary aim of experimental research is to establish cause-and-effect relationships (Em, 2024).

Research Groups

The study sample consisted of 35 voluntary university students (15 females, 20 males) aged 20 to 24, enrolled in the Recreation Department of the Faculty of Sports Sciences at Aydın Adnan Menderes University during the 2024–2025 academic year, with no prior sports background. To determine the representativeness of the sample, a power analysis using G*Power was conducted, which indicated that 28 participants were needed to detect a medium effect size with a 5% error rate and 95% power (Ajilchi et al., 2021). Therefore, the sample size of 35 was considered adequate. The participants were divided into an experimental group (N=20) and a control group (N=15) without random selection. Inclusion criteria were: Physical and perceived fitness suitable for exercise, voluntary participation, absence of injury or illness history and risk, consent to attend regular step aerobics sessions for at least 8 weeks, and no prior rhythm or dance training or long-term participation in music-based exercise programs. Exclusion criteria included unwillingness to participate, irregular attendance, being under 18 years old, knee joint injuries, chronic illnesses, and professional dancers.

Ethical Approval

This research has received approval from the Aydın Adnan Menderes University Human and Social Sciences Ethics Committee with the decision number E-21315140-050.04-721027, dated 22.04.2025 and numbered 22/26.

Data Collection Tools

Data were collected using scales measuring exercise motivation, stress coping, and happiness during pre-test and post-test phases. No anthropometric or functional movement analyses were conducted. The data collection process of the study was carried out over an eight-week period starting from the last week of April. After pre-tests, the experimental group (EG) and control group (CG) underwent the following procedures:

Step-Aerobics Intervention:

Experimental Group (EG): For the experimental group of the study, step-aerobic exercises were administered by the researcher (a certified senior step-aerobics instructor) twice a week for 8 weeks, lasting between 45 minutes and 1 hour per session, accompanied by music with a tempo ranging from 128 to 140 BPM, and progressing from moderate to high intensity. Each session included 15 minutes of active warm-up, 15 to 45 minutes of main workout, 10 minutes of cool-down (45 to 55 minutes), and 5 minutes of stretching exercises. Step aerobics choreography consisted of movements such as Basic Step, V-Step, A-Step, Turn Step, Corner Knee, Side Lift, L-Step, T-Step, Over the Top, Straddle, Repeater Knee, Charleston, Mambo, Tap Up / Tap Down, Knee Lift, Leg Curl, Step Touch, Grapevine, Kick Step, and Box Step (Jazz Square). Pre-tests measuring health-based exercise motivation, stress coping, and happiness were administered prior to the intervention, with post-tests conducted after the 8-week program. The intervention protocol for the experimental group is presented in Figure 1.

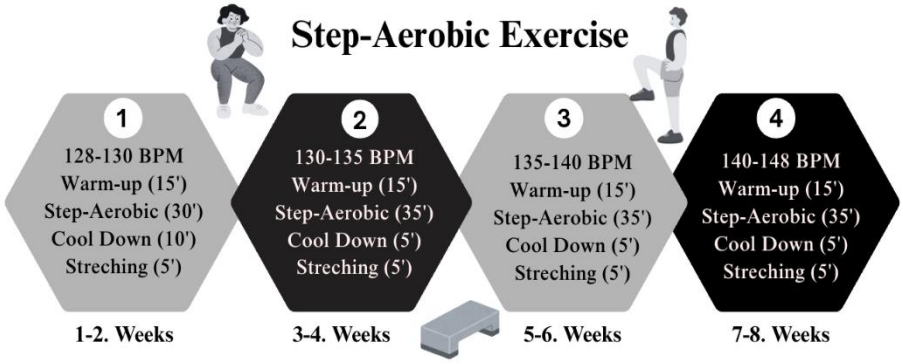

Figure 1. Step-aerobic exercise program

Control Group (CG): Participants in the control group, who did not engage in regular exercise, were instructed to maintain their daily routines without joining any exercise program. No experimental intervention was applied to this group. Pre- test and post-tests using the same scales for health-based exercise motivation, stress coping, and happiness were administered at the beginning and end of the 8-week period to evaluate any differences attributable to participation in step aerobics.

Collection of Data

Exercise Motivation Scale (EMS): Developed by Rogers and Morris and adapted into Turkish by Gürbüz et al., (2006), this unidimensional 22-items scale uses a 5-point Likert format. The Turkish adaptation reported a Cronbach's alpha of .93, indicating high reliability for assessing health-related exercise motivation. In the present study, Cronbach's alpha values were .97 for the pre-test and .93 for the post-test.

Stress Coping Scale (SCS): Developed by Türküm (2002), these 23-items scale uses a 5-point Likert format and comprises three subdimensions: seeking social support, problem orientation, and avoidance. Reliability coefficients reported by Türküm (2002) were .78 for the total scale, and .85, .80, and .65 for the subdimensions respectively. Scores range from 23 to 115 overall, with subscale ranges of 1–40 for avoidance and problem orientation, and 1–35 for social support seeking. In the current study, Cronbach's alpha coefficients were .86 (pre-test) and .90 (post-test).

Happiness Scale (HS): Developed by Demirci and Ekşi (2018), these 6 items, unidimensional 5 point Likert scale includes no reverse-coded items. Exploratory factor analysis showed factor loadings between .59 and .78. Confirmatory factor analysis indices were χ^2 (N=450) = 28.42, $p < .001$; CFI = .99; NFI = .98; NNFI = .98; SRMR = .029; RMSEA = .069. Factor loadings ranged from .50 to .77, and the Cronbach's alpha reliability was .83. Corrected item-total correlations ranged from .45 to .65. In this study, Cronbach's alpha values were .87 (pre-test) and .90 (post-test).

Analysis of Data

Statistical analyses were conducted using SPSS 27.00. Descriptive statistics including frequency, percentage, and mean were calculated for participant characteristics. Normality of pre-test and post-test scores for all scales was assessed through Kolmogorov-Smirnov tests, skewness, and kurtosis values (Field, 2018). The exercise motivation and happiness scales did not meet normality assumptions in either pre- or post-tests, whereas the stress coping scale met normality criteria. Accordingly, non-parametric Mann-Whitney U tests were used for exercise motivation and happiness scales, and parametric Independent Samples t-tests were applied for the stress coping scale to compare groups. To assess within-group differences between pre-test and post-test scores, Wilcoxon Signed-Rank tests were conducted for non-normally distributed scales, and Paired Sample t-tests for normally distributed scales. Statistical significance was set at $p < 0.05$.

Table 1. Descriptive statistics

Groups	Scales	Measure	N	X	SD
Experimental	EMS	Pre-Test	20	19.63	17.57
		Post-Test	20	21.10	8.45
	SCS	Pre-Test	20	77.05	15.23
		Post-Test	20	87.15	14.93
	HS	Pre-Test	20	18.03	4.56
		Post-Test	20	19.37	1.71
Control	EMS	Pre-Test	15	15.83	15.83
		Post-Test	15	13.83	8.16
	SCS	Pre-Test	15	76.26	11.51
		Post-Test	15	80.46	14.90
	HS	Pre-Test	15	16.83	4.16
		Post-Test	15	15.13	5.18

FINDINGS

This section presents the results related to the research hypotheses, along with the corresponding tables and interpretations, in sequential order.

Table 2. Results of Mann-Whitney U Test and Wilcoxon T-Test for independent groups

EMS	Groups	N	X̄	SD	Mann-Whitney U	Z	p	Wilcoxon t-test
Pre-Test	Experimental	20	19.63	22.98	117.50	-1.088	.277	**.001****
	Control	15	15.83	5.26				
Post-Test	Experimental	20	21.10	7.86	88.00	-2.070	**.03***	
	Control	15	13.83	8.16				

*p<0.05, **p<0.01

When examining the results of the Mann-Whitney U test for exercise motivation among individuals who participated in and did not participate in the step aerobics intervention (Table 2), it was found that the pre-test mean score of the experimental group was ($\bar{x}$ = 19.63; SD=22.98), while the control group's pre-test mean score was ($\bar{x}$ = 15.83; SD=5.26). According to the Mann-Whitney U test, there was no statistically significant difference between the pre-test scores of the experimental and control groups (p = .277; Z = -1.088; MW = 117.50). However, for the post-test scores, the experimental group had a mean score of ($\bar{x}$ = 21.10; SD=7.86), while the control group had a mean score of ($\bar{x}$ = 13.83; SD=8.16). The Mann-Whitney U test indicated a statistically significant difference between the post-test scores of the two groups (p < .05; Z = -2.070; MW = 88.00). This difference in the post-test scores was in favor of the experimental group, whose mean score was higher than that of the control group. Furthermore, a Wilcoxon signed-rank test was conducted to determine whether there was a significant change between the pre- and post-test scores within the experimental group, and the results revealed a statistically significant increase in favor of the experimental group (p < .001). In conclusion, participation in the 8-week step aerobics intervention had a positive effect on improving individuals' exercise motivation.

Table 3. Results of T-Test and Paired Sample T-Test for independent groups

SCS	Group	N	X̄	SD	t-test	F	p	Paired Sample t test
Pre-Test	Experimental	20	77.05	15.23	132.500	-.349	.727	**.001****
	Control	15	76.26	11.51				
Post-Test	Experimental	20	87.15	14.93	1.1577	7.030	**.012***	
	Control	15	80.46	14.90				

*p<0.05, **p<0.01

When examining the results of the Independent Samples t-test for stress coping levels among individuals who participated in and did not participate in the step aerobics intervention (Table 3), it was found that the pre-test mean score of the experimental group was ($\bar{x}$ = 77.05; SD=15.23),

while the control group's pre-test mean score was ($\bar{x}$ = 76.26; SD=11.51). According to the Independent Samples t-test, there was no statistically significant difference between the pre-test scores of the experimental and control groups (p = .727; F = -0.349; t = 132.50). However, in the post-test, the experimental group had a mean score of ($\bar{x}$ = 87.15; SD=14.93), while the control group had a mean score of ($\bar{x}$ = 80.46; SD=14.90). The Independent Samples t-test revealed a statistically significant difference between the post-test scores of the two groups (p = 0.012; F = 7.030; t = 1.157). Furthermore, a Paired Samples t-test was conducted to assess the difference between the pre- and post-test scores within the experimental group, and a significant increase was found in favor of the post-test scores (p < .001). In conclusion, participation in the 8-week step aerobics intervention had a positive effect on improving individuals' stress coping levels.

Table 4. Results of Mann-Whitney U and Wilcoxon T-Test for independent groups

HS	Group	N	$\bar{X}$	SD	Mann-Whitney U	Z	p	Wilcoxon t-test
Pre-Test	Experimental	20	18.03	4.56	.181	3.668	.064	**.001***
	Control	15	16.83	4.16				
Post-Test	Experimental	20	19.37	3.71	107.00	-1.254	.210	
	Control	15	15.13	4.18				

*p<0.01

When examining the results of the Mann-Whitney U test for happiness levels among individuals who participated in and did not participate in the step aerobics intervention (Table 4), the pre-test mean score of the experimental group was found to be ($\bar{x}$ = 18.03; SD=4.56), while that of the control group was ($\bar{x}$ = 16.83; SD=4.1*6*). According to the Mann-Whitney U test, there was no statistically significant difference between the pre-test scores of the experimental and control groups (p = .064; Z = -3.668; MW = 0.181). For the post-test scores, the experimental group had a mean score of ($\bar{x}$ = 19.37; SD=3.71), while the control group had a mean score of ($\bar{x}$ = 15.13; SD=4.18). The Mann-Whitney U test revealed no statistically significant difference between the post-test scores of the two groups (p = .210; Z = -1.254; MW = 107.00). However, a Wilcoxon signed-rank test conducted to examine the difference between the pre- and post-test scores within the experimental group revealed a statistically significant increase in favor of the post-test scores (p < .001). In conclusion, participation in the 8-week step aerobics intervention positively affected individuals' happiness levels.

DISCUSSION AND CONCLUSION

This study aimed to experimentally examine whether participation in step-aerobic classes would lead to changes in university students' health-related exercise motivation, coping with stress, and levels of happiness. The research was conducted with a total of 35 university students aged between 20 and 24 and was designed with an experimental and control group. At the beginning of the study, both groups were evaluated on the variables of exercise motivation, stress coping, and

happiness. The initial assessments revealed that the pre-test scores for all variables were at similar levels between the groups. The experimental group participated in a structured step-aerobic module for eight weeks, two days per week, with each session lasting between 45 and 60 minutes, involving moderate to high intensity. The control group received no intervention and continued their daily routines.

Post-intervention measurements showed that the experimental group demonstrated statistically significant improvements compared to the control group in the post-tests of exercise motivation and coping with stress ($p<.05$), whereas no significant differences were found between the groups in the pre-tests of these variables. Although no statistically significant differences were found in the happiness scale between the experimental and control groups at either pre- or post-test levels, the within-group analysis revealed a statistically significant increase in the post-test scores of the experimental group. These findings indicate that participating in step-aerobic exercises for eight weeks significantly improved the experimental group's exercise motivation, stress coping skills, and happiness levels. Supporting evidence can also be found in the literature. In line with the confirmation of hypotheses H_1 and H_4, the results demonstrated that regular participation in step-aerobic exercises significantly enhances individuals' exercise motivation levels. When interpreted through the lens of Deci and Ryan's (1985) Self-Determination Theory, which emphasizes the fulfilment of autonomy, competence, and relatedness needs to foster intrinsic motivation, these findings gain further significance. Step-aerobic activities, especially when accompanied by music and performed in groups, provide an environment that supports these needs holistically, thereby enhancing participants' health-related exercise motivation. Consistent with this, previous research highlights the role of group exercises in promoting intrinsic motivation (Ntoumanis et al., 2017; Teixeira et al., 2012). The nature of aerobic exercise -blending rhythmic movements and music- encourages enjoyment, adherence, and long-term engagement (Park et al., 2023). Therefore, the observed increase in motivation likely reflects physical, emotional, and social satisfaction among participants.

Regarding stress coping, the study's findings (supporting H_2 and H_4) show that individuals participating in the step-aerobic program experienced a statistically significant improvement in their ability to cope with stress. Extensive literature on the psychological benefits of physical activity supports this outcome. Across various age groups, physical activity has been associated with reduced levels of stress, anxiety, and depression, and increased psychological well-being (Fu et al., 2025; Mikkelsen et al., 2017; Huang & Wong, 2025; Rebar et al., 2021). Aerobic exercises regulate stress hormones (e.g., cortisol) and promote the release of neurotransmitters such as serotonin and endorphins, enhancing resilience to stress (Hillman et al., 2008; Rebar et al., 2015). Group-based physical activity not only provides physiological benefits but also enhances coping strategies through social interaction (Bramwell et al., 2023; Liu et al., 2024). The structure of step-aerobics, which includes choreography and music, may reduce attention dispersion and anxiety by fostering cognitive focus (Lu et al., 2024; Zinelabidine et al., 2022). In addition, the group setting promotes a sense of social support and encourages problem-focused coping strategies. For

instance, Lu et al. (2024) found that music-based aerobic exercise positively influences mood and reduces anxiety, while Zinelabidine et al. (2022) showed that learning choreography in aerobic dance improved cognitive function. These results provide robust support for the cognitive and emotional benefits of synchronized movement to music. Importantly, this study uniquely contributes to the literature by assessing coping skills development via standardized measures among young adults, a population typically facing high academic and social stress. Music, a core component of the step-aerobic module, is also known to lower cortisol and reduce sympathetic nervous system activity (Li & Min, 2024). Music has been shown to increase exercise tolerance by approximately 15%, enhancing flow and reducing perceived stress (Karageorghis & Terry, 2001; Mastura et al., 2012). Dingle et al. (2021) note that people naturally synchronize with music while dancing, which has mood-enhancing effects. Hanna (2017) similarly advocates for dance as a stress-relief strategy. Ayhan and Yalçınkaya (2023) observed a 21.96% reduction in stress and an 18.01% increase in happiness following an 8-week step-aerobic program in middle-aged women. Mastura et al. (2012) also reported stress reduction after an aerobic dance intervention. These results underscore the psychological impact of such interventions. Ernst et al. (2006) emphasize that exercise promotes neurogenesis and neural plasticity even in adult brains, thus improving stress resilience.

Regarding happiness, although there was no statistically significant difference between the experimental and control groups, a significant within-group increase was observed in the experimental group. Thus, hypothesis H_3 was rejected while H_4 was supported. This finding supports the notion that subjective well-being indicators like happiness may require longer-term, meaning-oriented interventions to show significant group-level changes (Biddle et al., 2019; Lyubomirsky et al., 2005). Previous studies have shown that aerobic exercise is associated with improvements in mood, life satisfaction, and positive self-perception (Lawton et al., 2017; Mischenko et al., 2024; Pasco et al., 2011). However, the extent and durability of these effects vary depending on factors such as lifestyle, social support, and individual cognitive processes. Considering that the study sample consisted of university students, this result is not unexpected. Therefore, while the step-aerobic intervention may promote happiness to a certain extent, a longer or more intensive program may be necessary to deepen the impact.

The current study is particularly significant in that it explores how subjective variables like happiness are influenced by factors such as group interaction, musical environment, physical movement, and social dynamics. Given that music acts as a holistic therapeutic agent across mental, emotional, and physical domains (Deshpande et al., 2021), and that dance allows individuals to escape daily stressors (Suldo & Huebner, 2006), step-aerobics should be recognized as a multi-dimensional tool for student well-being. Moreover, the relationship between step-aerobics and happiness is underexplored in the literature, adding originality to this study. A study by Cai et al. (2014) showed increased melatonin levels after 10 weeks of moderate-to-high intensity step-aerobics in postmenopausal women, suggesting potential improvements in happiness despite not directly measuring it. Similarly, Genç et al. (2025) found that 12-week

Zumba interventions improved happiness-related outcomes among Turkish boarding school students. Most previous step-aerobic studies have focused on female participants (Cai et al., 2014; Mosher et al., 2005) however, this study involved a predominantly male sample, suggesting that step-aerobic exercise may be beneficial across genders and for both physical and psychological parameters.

In conclusion, this study provides important contributions to the literature by examining the effects of a step-aerobic exercise program on university students' exercise motivation, coping with stress, and levels of happiness. The findings reveal that eight weeks of regular step-aerobic participation significantly improved students' health-related exercise motivation and stress coping skills. These results support the view that physical activity enhances not only physical health but also psychological functioning. Although no statistically significant difference was observed in happiness levels between the experimental and control groups, the within-group improvements in the experimental group suggest a positive trend. This indicates that happiness, as a multidimensional and subjective construct, may require longer or more personalized interventions to produce statistically robust effects. Step-aerobic programs, while effective at the group level, may be less suited to influence individually varying constructs such as happiness in the short term. The significant improvements observed in the experimental group across all three measures highlight the potential of moderate-to-high intensity step-aerobics as an effective intervention for enhancing student well-being. However, the limited sample size and restriction to university students reduce the generalizability of these findings. Future studies should aim to include larger and more diverse samples across different age groups and explore various exercise modalities. The results also underscore the importance of integrating music-based group exercise programs into university wellness and support initiatives to foster students' psychological well-being. In addition, based on the research findings, the following recommendations are provided for researchers and practitioners:

- Music-based exercise modules -such as step-aerobics- can be recommended as effective tools for addressing issues such as exam anxiety, academic stress, and social isolation.
- Trainers, psychological counselors, and educational psychologists may consider implementing music-supported step-aerobic programs conducted twice a week for 45–60 minutes at moderate to high intensity to promote multidimensional development.
- Although this study did not reveal a statistically significant difference between groups in terms of happiness levels, a significant improvement was observed within the experimental group. This finding suggests that indicators of subjective well-being may respond more effectively to longer-term and more intensive interventions. Therefore, it is recommended that future studies employ at least 12-week interventions or compare different dance-based exercise formats.
- Since this study was limited to university students, future research could be designed to examine the effects of step-aerobic exercises in different age groups (e.g., adolescents, middle-aged adults, and older adults). In addition, conducting gender-based comparative

studies is important for understanding how exercise motivation is shaped within the context of social norms.

- To enhance the scope and depth of the findings, future research could also adopt mixed-method designs.

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Authors' Contribution: All stages of the study belong to the corresponding author.

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