



EFFECT OF MUSIC ON PHYSICAL FITNESS FOR GRADE 11 IN FEMALE VOVINAM STUDENTS AT TRAN QUANG KHAI HIGH SCHOOL, HOCHIMINH CITY, VIETNAM

Hien, Le Thuⁱ

Saigon University,
Vietnam

Abstract:

The purpose of this study was to evaluate the application of music to female students when participating in Vovinam sessions at Tran Quang Khai High School, Hochiminh City, Vietnam, to improve their physical fitness. 80 healthy female students were chosen and divided into two groups: 40 female students were in the experimental group with the application of music, and the 40 female students remaining were in the 36 training sessions without music. The music tempos were around 120-140 bpm. Two famous Vietnamese songs were chosen to use in Vovinam for training. Six fitness tests, such as 30 seconds sit-up test (evaluated the core strength), 30m sprint test (speed), 4x10m Shuttle run test (agility), standing long jump test (the explosive power of the legs), handgrip strength test (strength of the hand), 5 minutes running field test (maximal aerobic speed-MAS) were used to evaluate the physical fitness for female students. The results indicated that the application of music improved the power of the legs, agility, speed, core strength, strength of the hand, and MAS. In short, the application of music for female students participating in badminton had many benefits in increasing their physical fitness. More studies should evaluate the influence of music on many kinds of sports and assess the concentration of participants when applying music.

Keywords: application of music, Vovinam martial art, grade 11 students, physical fitness, 36-week training.

1. Introduction

Vovinam (named Viet Vo Dao in Vietnamese martial art) was founded by the late martial artist Nguyen Loc in 1936, but at this time, it was operating in secret, and it was not until 1938 that it was publicly announced. Based on the core of national martial arts and wrestling, Master Nguyen Loc tried to study the quintessence of other martial arts schools in the world to accommodate, utilize and resolve, especially to improve his

ⁱ Correspondence: email hien.lt@sgu.edu.vn

technical foundation according to the principle of developing softness and hardness. Currently, Vovinam is being used in many schools in Vietnam as an extracurricular sport in schools. Under the direction and attention of the Vietnamese Government for traditional martial arts and school sports, the Ministry of Education and Training has included Vovinam in the official program of activities since 2018. This is the basis for Vovinam to develop strongly in schools. Accordingly, the Department of Education and Training of Ho Chi Minh City issued the official dispatch No. 3991/GDĐT-CTTT dated 25th October 2017 to implement the Vovinam basic sports program in schools for the 2017-2018 school year.

Music in sports was considered a potential support tool to help improve morale (Bigliassi *et al.*, 2013), increase exercise duration (Maddigan *et al.*, 2018; Thakare *et al.*, 2017) and is an important tool to stimulate people who were not used to exercising to participate in low-intensity exercises (Pantania *et al.*, 2020). Many previous studies suggested that music played a significant role in martial arts performance and training. Pre-task music exposure has been shown to improve choice visual reaction times in elite taekwondo athletes, enhancing performance and increasing positive feelings and arousal (Greco *et al.*, 2024).

In taekwondo and karate training, music chosen by athletes and upbeat music significantly affects motivation and performance, with fast-paced music increasing motivation during technical exercises and slow-paced music aiding recovery (Erbas & Cakir, 2022). It was also used as a motivator to help individuals who did not have enough determination to perform physical exercises completely (Mohammadzadeh *et al.*, 2008), due to the rather boring repetition of exercises, physical fitness, or too high intensity (pressure) of the exercise. A recent study focused on enhancing student engagement in Vovinam classes through targeted measures, resulting in significant improvements in intellectual, cognitive, and learning positivity among participants (Chau & Thanh, 2024). However, there has been a lack of research on the application of music in Vovinam martial arts to improve the physical qualities of female students in grade 11 at Tran Quang Khai High School, Hochiminh City, Vietnam, which was the purpose of this study.

2. Methodology

2.1. Participants

The volunteer and selected participants were 80 healthy female students in grade 11 at Tran Quang Khai High School who participated in the Vovinam club. All participants joined the training for a year. 40 female students were chosen to take part in Vovinam training using music (the experimental group or M group), and the remaining 40 female students were not using music (the control group or C group).

None of the participants had any physical problems, smoking, alcohol use, or were taking any medication. They were informed of the test procedures before providing a written consent form to participate.

2.2. Design

Two weeks before the courses began, all participants answered about their personal information, health status, sport-related injury history, etc. Any problems participants showed might be excluded. Besides, all participants were introduced to the fitness tests and how to implement them. One week after that, all participants came to examine their physical fitness.

Six tests were used to identify physical fitness for female students, such as 30 seconds sit-up test (evaluated core strength), 30m sprint test (speed), 4x10m Shuttle run test (agility), standing long jump test (the explosive power of the legs), handgrip strength test (maximum isometric strength of the hand), and 5 minutes running field test (maximal aerobic speed-MAS). These tests were suitable to evaluate the fitness of amateur athletes (Ministry of Education & Training, 2008) and suited to evaluate general physical fitness (Tuan & Son, 2017), with high validity and reliability.

All participants underwent 36 training sessions (18 sessions in semester 1 and 18 sessions in semester 2) on Tran Quang Khai school grounds. Each session is a maximum of 90 minutes for training with the same conditions, time for studying and facility use, etc., in two groups. The sessions took part in the afternoon (from 4.00 to 6.00 pm) on Wednesday each week. The control group was under normal training in forms like normal days without music. “Dong mau lac hong” and “Noi giong tien rong” were two songs used in the study for only forms training in the experimental group. These two songs can be downloaded on YouTube (<https://www.youtube.com/watch?v=iKmBaJBeNcc> and <https://www.youtube.com/watch?v=U--Z7huXlQ>). These were selected for non-profit purposes, did not advertise or recommend these songs for any reason, and were used for the purpose of this research only. These were chosen with a vibrant beat, created excitement in listeners and met Vietnamese culture. Music was played through the speakers (JBL Party box 300) when students were in form training. Music was applied in one training session, as shown in Table 1.

Table 1: The application of music in 90 minutes in a Vovinam session

No.	Type of exercises	Times	Applied music
1	Class announcement	5 mins	X
2	Warm-up	15 mins	X
3	Break	5 mins	X
4	Form training	30 mins	Music
5	Break	5 mins	X
6	Form training	20 mins	Music
7	Cool-down	10 mins	X
Summary		90 minutes	50 minutes

At the end of the 36 training sessions, all participants took an examination about their fitness level one more time as in the first-time testing.

2.3. Statistical Analysis

Data collections were analyzed by using SPSS for Windows version 20. Independent Sample T-test was used to determine the differences in fitness tests between the experimental and control groups. A pair sample t-test was used to identify the difference between pre- and post-test in the two groups. A p-value of less than 0.05 was determined to be a significant difference. Values were presented in mean \pm standard deviation ($\bar{x} \pm SD$).

3. Results and Discussions

The participants' characteristics are shown in Table 2.

Table 2: Participants' characteristics (n = 80)

Group	Height (cm)	Weight (kg)	BMI
Control (40)	156.68 \pm 4.78	49.95 \pm 7.82	20.32 \pm 2.9
Experimental (40)	158.83 \pm 6.54	52.75 \pm 9.19	20.86 \pm 3.08

Besides, mean differences in female students' fitness in pre- and post-test are presented in Table 3, as well as mean differences in female students' fitness in the control and experimental group after the application of music are presented in Table 4.

Table 3: Means values of all tests between pre and post-test in the control and experimental group

Test	Group	Pre-test	Post-test	df	t
1	Control	25.37 \pm 2	25.79 \pm 2.09	38	1.67*
	Experimental	25.33 \pm 2.01	26.26 \pm 2.28		2.908**
2	Control	13.1 \pm 1.55	13.23 \pm 1.53	38	0.95*
	Experimental	13.13 \pm 1.57	13.48 \pm 1.48		3.826***
3	Control	142.6 \pm 10.89	145.5 \pm 9.88	38	2.01*
	Experimental	142.6 \pm 9.85	149.2 \pm 8.59		5.037***
4	Control	7.01 \pm 0.37	6.98 \pm 0.38	38	0.43*
	Experimental	7.02 \pm 0.31	6.89 \pm 0.31		2.103**
5	Control	13.29 \pm 0.51	13.17 \pm 0.35	38	0.94*
	Experimental	13.3 \pm 0.48	13.01 \pm 0.48		3.192**
6	Control	812.3 \pm 39.05	832.7 \pm 37.54	38	2.47**
	Experimental	812 \pm 73.28	847.6 \pm 74.8		4.118***

Note: 1: Handgrip strength (kg), 2: 30s sit-up (times), 3: Standing long jump (cm), 4: 30m sprint (s), 5: 4x10m Shuttle run (s), 6: 5-min running field (m). *, **, ***: Significant differences at levels of 0.05, 0.01, 0.001, respectively.

Table 4: Means values of all tests between the control and experimental group after the application of music

Test	Group	Post-test	df	t	p
1	Control	25.79±2.09	38	2.289	0.000
	Experimental	26.26±2.28			
2	Control	13.23±1.53	38	2.388	0.001
	Experimental	13.48±1.48			
3	Control	145.5±9.88	38	3.523	0.000
	Experimental	149.2±8.59			
4	Control	6.98±0.38	38	0.89	0.001
	Experimental	6.89±0.31			
5	Control	13.17±0.35	38	1.265	0.000
	Experimental	13.01±0.48			
6	Control	832.7±37.54	38	4.294	0.004
	Experimental	847.6±74.8			

Note: 1: Handgrip strength (kg), 2: 30s sit-up (times), 3: Standing long jump (cm), 4: 30m sprint (s), 5: 4x10m Shuttle run (s), 6: 5-min running field (m)

Results in Table 3 and Table 4 showed that there were significant differences between the control and experimental groups after the application of music in all 6 physical fitness tests. It indicated that the application of music showed an improvement in the power of the legs, agility, and speed, core strength, strength of the hand, and MAS in female students who participated in Vovinam sessions at Tran Quang Khai High School.

Music is a potential aid in improving mental well-being (Bigliassi *et al.*, 2013) and an important tool to stimulate people who have not been in the habit of exercising and participating in low-intensity exercises (Pantania *et al.*, 2020). Music enhances endurance and duration of activity when performing exercises (Crust, 2004; Ghaderi *et al.*, 2009). Cole & Maeda (2015) noted that there was an increase in achievement in the 12-minute Cooper run in healthy females (not in males) when compared between the use of music and the control one (no music). Karageorghis & Terry (2009) showed that music can be applied during training and even sports competitions in many ways. Rendi *et al.* (2008) also suggested that music applied to a sports context should probably focus on the specific sport and the types of movement. In our study, the tempo of songs was from 120-130 bpm for training. Thus, this tempo showed that it was suitable for female students and the specific movement in form training in Vovinam.

Hutchinson & Karageorghis (2013) showed that the attention of participants influenced the application of music. In high-intensity exercise, they had to have maximum concentration on the task of work-out, which required synchronization of music tempo with each specific type of activity (personalization of music tempo). In theory, when the song's melody rang out, it tended to attract individual attention, no matter how intense the training and how fast or slow the music tempo. Therefore, it is necessary to have in-depth research on the ability of the participants to concentrate on future studies to explain the impact of music on the fitness level of participants.

The results obtained in this study show that the application of music in the form of Vovinam training might improve achievement in the power of the legs, agility, speed, core strength, strength of the hand, and MAS. Future studies should implement the use of music in other sports, such as soccer, basketball, volleyball, etc., as well as the classification of input students, an assessment of the student's auditory ability, and the development of an appropriate exercise for females in the application of music.

4. Conclusion

The application of music for female students participating in Vovinam in form training had many benefits, such as increased power of the legs, agility and speed, core strength, strength of the hand, and MAS. More studies should evaluate the influence of music on many kinds of sports and the assessment of the concentration of participants during the application of music.

Conflict of Interest Statement

I have no competing interests.

About the Author

Hien, Le Thu works as a specialist in Physical Education and coaching in Vovinam in Hochiminh City, Vietnam.

References

- Bigliassi, M., Estanislau, C., Carneir, J. G., Kanthack, T. F. D., & Altimari, L. R. (2013). Music: A psychophysiological aid to physical exercise and sport. *Arch Med Deporte*, 30(5), p. 311-320.
- Bigliassi, M., Karageorghis, C. I. Hoy, G. K., & Layne, G. S. (2019). The Way You Make Me Feel: Psychological and cerebral responses to music during real-life physical activity. *Psychology of Sport and Exercise*, 41, 211-217. doi: [10.1016/j.psychsport.2018.01.010](https://doi.org/10.1016/j.psychsport.2018.01.010).
- Chau, L. T. B., & Thanh, N. D. (2024). Evaluating the effectiveness of the application of measures to improve students' positiveness during vovinam classes at FPT University, HCMC, Vietnam. *Journal of Advances in Sports and Physical Education*, 7(6), 175-180. doi: [10.36348/jaspe.2024.v07i06.010](https://doi.org/10.36348/jaspe.2024.v07i06.010).
- Cole, Z., & Maeda, H. (2015). Effects of listening to preferential music on sex differences in endurance running performance. *Percept. Mot. Ski*, 121, p.390–398.
- Crust, L. (2004). Carry-over effects of music in an isometric muscular endurance task. *Percept. Motor Skills*, 98(3), p. 985-991. doi: [10.2466/pms.98.3.985-991](https://doi.org/10.2466/pms.98.3.985-991). PMID: 15209316.

- Erbas, U., & Cakir, Z. (2022). The effect of music on the motivation of athletes in taekwondo and karate training. *Education Quarterly Reviews*, 5(3), 489-496. doi: 10.31014/aior.1993.05.03.561.
- Ghaderi, M., Rahimi, R., & Azarbayjani, M. A. (2009). The effect of motivational and relaxation music on aerobic performance, rating perceived exertion and salivary cortisol in athlete meals. *Research in Sport, Physical Education and Recreation*, 31(2), p. 29-38. doi: [10.4314/sajrs.v31i2.47589](https://doi.org/10.4314/sajrs.v31i2.47589).
- Greco, F., Quinzi, F., Chiodo, S., Cerulli, C., Tranchita, E., Bertollo, M., Emerenziani, G. P. (2024). The effects of pre-task music on choice visual reaction time in elite taekwondo athletes. *JSAMS*, 27(4), 276-280. doi: [10.1016/j.jsams.2024.01.002](https://doi.org/10.1016/j.jsams.2024.01.002)
- Hutchinson, J. C., & Karageorghis, C. I. (2013). Moderating influence of dominant attentional style and exercise intensity on responses to asynchronous music. *Journal of Sport & Exercise Psychology*, 35, p.625–643. doi: [10.1123/jsep.35.6.625](https://doi.org/10.1123/jsep.35.6.625).
- Karageorghis, C. I., & Terry, P. C. (2009). The psychological, psychophysical, and ergogenic effects of music in sport: A review and synthesis. In Bateman, A. J., & Bale, J. R. (Eds.) *Sporting sounds: relationships between sport and music*. London: Routledge. p.13-36.
- Maddigan, M. E., Sullivan, K. M., Halperin, I., Basset, F. A., & Behm, D. G. (2018). High tempo music prolongs high intensity. *Peer J*, e6164. doi: 10.7717/peerj.6164. PMID: [30643679](https://pubmed.ncbi.nlm.nih.gov/30643679/).
- Ministry of Education and Training. (2008). *Decision No. 53/2008/QĐ-BGDĐT on assessment and classification of the students' fitness*, issued by the Minister of Education and Training on 18th Sept, 2008 (in Vietnamese). Retrieved from: <https://moet.gov.vn/van-ban/vanban/Pages/chi-tiet-van-ban.aspx?ItemID=1000>.
- Mohammadzadeh, H., Tartibiyan, B., & Ahmadi, A. (2008). The effects of music on the perceived exertion rate and performance of trained and untrained individuals during progressive exercise. *Facta Universitatis-Series: Physical Education and Sport*, 6(1), p.67-74.
- Pantania, V. M., Padulo, J., Luliano, E., Ardigo, L. P., Cular, D., Miletic, A., & Giorgio, A. D. (2020). The psychophysiological effects of different tempo music on endurance versus high-intensity performances. *Front Psychol*, 11, 74. doi: [10.3389/fpsyg.2020.00074](https://doi.org/10.3389/fpsyg.2020.00074). PMID: 32116903.
- Rendi, M., Szabo, A., & Szabó, T. (2008). Performance enhancement with music in rowing sprint. *The Sport Psychologist*, 22(2), p.175-182. doi: [10.1123/tsp.22.2.175](https://doi.org/10.1123/tsp.22.2.175).
- Thakare, A. E., Mehrotra, R., & Singh, A. (2017). Effect of music tempo on exercise performance and heart rate among young adults. *Int J Physiol Pathophysiol Pharmacol*, 9(2), p. 35-39. [PMID: 28533890].
- Tuan, T. M., & Son, H. T. (2017). The development of general physical fitness of female students at Saigon University after participating selective courses of basic soccer, volleyball, and basketball. *Journal of Education and Sport Sciences*, 4(20), 36-40.

Creative Commons licensing terms

Authors will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Physical Education and Sport Science shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflict of interests, copyright violations and inappropriate or inaccurate use of any kind content related or integrated on the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons attribution 4.0 International License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).