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The Effectiveness of South Sulawesi Local Culture-Based Aerobic Dances on Cardiovascular Endurance and Flexibility in Young Women

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Abstract. This study aims to investigate the impact of South Sulawesi's local culture-based aerobic dances on enhancing cardiovascular endurance and flexibility. The research method used was a quasi-experimental design with a pretest-posttest group approach. The research subjects consisted of 20 healthy young women aged 18–25 years. The intervention program was conducted over eight weeks, with participants attending three sessions per week, each lasting 45 minutes. The aerobic dance program incorporated traditional South Sulawesi dance movements and music. Cardiovascular endurance was measured using the Beep Test, while flexibility was assessed through the Sit and Reach test. The results showed a significant increase in both variables with $p < 0.05$. These findings indicate that local culture-based aerobic dances are effective in enhancing physical fitness while providing a more meaningful and enjoyable exercise experience through cultural engagement. This research provides a scientific foundation for developing physical training programs based on local wisdom that can be implemented in community-based physical activities.

Keywords: aerobic dances, local culture, cardiovascular endurance, flexibility

1 Introduction

Aerobic dance is a form of physical activity that combines rhythmic and dynamic movements with a certain musical rhythm and is carried out continuously for a certain duration to improve overall physical fitness. This exercise has been scientifically proven to have a significant impact on increasing the working capacity of vital organs such as the heart, lungs, and circulatory system (Adams & Linke, 2019; Guadagni et al., 2020). Controlled increases in heart rate

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intensity during aerobic dance can strengthen the heart muscle, increase stroke volume, and improve blood and oxygen circulation throughout the body (Kyselovičová & Zemková, 2024; Veri et al., 2022). Not only limited to the cardiovascular aspect, aerobic dance also contributes to increased muscle and joint flexibility, especially through variations in movements that require the use of various muscle groups in a wide range of motion (Budiarti et al., 2022). Physical fitness components such as cardiovascular endurance and flexibility are the main focus of this exercise, where cardiovascular endurance reflects the efficiency of the cardiopulmonary system in supplying oxygen during prolonged activity, while flexibility indicates the ability of joints and muscles to move optimally within their physiological range of motion. Several recent studies have also strengthened the effectiveness of aerobic dance in supporting general physical fitness. Rhythmic aerobic dance has a significant impact on increasing aerobic capacity and body flexibility (Kyselovičová & Zemková, 2024). Aerobic dance can be used effectively in fitness intervention programs, both for the purpose of improving cardiovascular health and developing overall body movement abilities (Arwani & Sukamti, 2024; Gaspari et al., 2024). Aerobic dance not only functions as a means of physical exercise but also becomes an important strategy in maintaining and improving quality of life through continuous improvement of physiological conditions.

In Indonesia, the integration of local cultural elements in the development of aerobic dances remains underexplored, despite the nation's vast cultural wealth, especially in the form of traditional dances and music, which hold great potential for incorporation into physical activities. South Sulawesi, as one of the provinces with a strong cultural heritage, features various regional dances and music such as the Pakarena Dance, Paduppa Dance, and Bosara Dance, all rich in movement aesthetics, rhythm, coordination, flexibility, and social symbolism (Asyrafunnisa, 2021; Islami & Astuti, 2023). These elements align with the core principles of aerobic dances, which emphasize rhythmic, dynamic, and structured movements. Moreover, traditional music such as drums and flutes can reinforce the emotional and cultural aspects of dances, thereby creating a more engaging and meaningful workout experience (Napo, 2024; Greco et al., 2022; Terry et al., 2019). This potential can be further developed into a form of dance that not only improves physical fitness, particularly cardiovascular endurance and aerobic flexibility but also serves as a medium for preserving local culture.

In the context of promoting sustainable physical fitness based on local wisdom, the integration of aerobics with elements of traditional dance and music from South Sulawesi is an innovative approach that is worth studying. Not only can it increase community involvement in physical activity, this approach also plays a role in preserving culture. This study aims to develop a model of aerobics based on the local culture of South Sulawesi and evaluate its effects on cardiovascular endurance and flexibility. The results of this study are expected to contribute to the fields of health sports, physical education, and cultural preservation through a measurable scientific approach.

2 Method

This study employed a quasi-experimental method with a pretest-posttest group design to examine the effects of the intervention on the selected variables. The research subjects consisted of 20 healthy female adolescents aged between 18 and 25 years who were actively engaged in aerobic dances. Participants were selected based on criteria such as being physically healthy,

not undergoing any medical treatment, and maintaining consistent attendance in aerobic dance activities. Two measurement instruments were used in this study: the multi-stage run test (beep test) for assessing cardiovascular endurance and the sit and reach test for evaluating lower body flexibility, particularly targeting the hamstring and lower back muscles. During the first meeting, all participants underwent a pretest to obtain baseline data. Subsequently, for eight consecutive weeks, participants engaged in an aerobic dance program based on traditional South Sulawesi culture, conducted three times a week for 45 minutes per session. This program integrated traditional movements characterized by rhythmic and dynamic patterns, consistent with the principles of aerobic dances. At the end of the intervention, a posttest was administered to measure changes. Pretest and posttest data were analyzed using a paired t-test to determine the significance of the differences observed. The results provided a clear picture of the effectiveness of local culture-based aerobic dances in enhancing cardiovascular endurance and flexibility among young women.

3 Result

The study involved 20 young women. The descriptive data of the pretest and posttest results, including minimum, maximum, mean, and standard deviation values, are presented in the table below.

Table 1. Description of Pretest and Posttest Data Results

	N	Min		Max		Mean		SD	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Cardiovascular Endurance	20	21,10	24,30	38,50	39,90	28,13	30,52	4,80	4,88
Flexibility	20	11,30	11,60	28,20	30,00	17,79	18,75	4,72	5,02

Table 1 shows the results of the data description of the minimum and maximum values from the pretest and posttest. Both tables show the description of the data that will be analyzed next, namely the average data, standard deviation, maximum value, and minimum value.

Next is the data normality test with the aim of determining whether or not the distribution of scores obtained from respondents is normal. The normality test used is the Shapiro-Wilk normality test. More details are described in table 2.

Table 2. Uji Normalitas Shapiro Wilk

	Significant		Information
	Pretes	Postes	
Cardiovascular Endurance	0,346	0,088	Normal
Flexibility	0,385	0,627	Normal

Based on Table 2, the normality tests conducted for both pretest and posttest were all normally distributed because they had a significance value > 0.05.

The next step is the analysis of the homogeneity of variance test which aims to determine whether the sample data used in the research that has been conducted has the same variance or is homogeneous.

Table 3. Uji Homogenitas

	Pretes		Postes		Information
	Levene Statistik	Sig	Levene Statistik	Sig	
Cardiovascular Endurance	0,782	0,463	0,825	0,444	Homogen
Flexibility	2,007	0,146	1,956	0,153	Homogen

Based on Table 3, the results of the homogeneity test described above are known from the pretest and posttest data scores that have been analyzed, all variables are homogeneous because the significance level is > 0,05.

The last is to conduct a paired sample T-Test, as in Table 4 below:

Table 4. Paired Sample Test

	Pretes	**Postes**	Information
Cardiovascular Endurance	0,00	0,00	Ada
Flexibility	0,00	0,00	Ada

Table 4 shows the data significance of 0.00 or significance <0.05, so there is a significant influence of South Sulawesi local culture-based aerobic dance on cardiovascular endurance and flexibility.

4 Discussion

The findings of this study reveal that aerobic dances based on South Sulawesi's local culture significantly improve cardiovascular endurance and flexibility in young women aged 18–25 years. The paired sample t-test analysis produced significance values of 0.00 ($p < 0.05$) for both variables, indicating meaningful differences between the pretest and posttest results following the eight-week intervention. This suggests that the intervention involving culturally inspired aerobic dances effectively enhanced the physical performance of participants. This effectiveness can be attributed to the dynamic and rhythmic characteristics of traditional movements, which also incorporate emotional and cultural dimensions that strengthen participant engagement. The combination of culturally familiar elements with modern aerobic principles likely creates a training experience that is both enjoyable and meaningful, contributing to overall physical fitness improvements, particularly in cardiovascular endurance and joint flexibility. These findings support the theory that integrating cultural components into physical activity can enhance training program effectiveness by boosting participation and motivation.

The observed increase in cardiovascular endurance, as indicated by improvements in VO_2 max, reflects a series of favorable physiological adaptations within the cardiovascular and respiratory systems of the participants following the eight-week training intervention. This enhancement

suggests that the heart and lungs have become more efficient in delivering oxygen to working muscles during sustained physical activity, which is a key marker of improved aerobic fitness. The rhythmic nature of aerobic dance movements, when combined with the structured and flowing motions of traditional South Sulawesi dances such as Pakarena and Paduppa, plays a significant role in stimulating these adaptations. These traditional dances are characterized by continuous and coordinated body movements that not only elevate the heart rate in a controlled manner but also engage large muscle groups over extended periods, thereby placing a beneficial demand on the cardiopulmonary system. Over time, such consistent aerobic activity promotes an increase in stroke volume the amount of blood ejected by the heart with each beat allowing the heart to pump more efficiently and effectively. Additionally, the resting heart rate typically decreases as a result of this training, indicating improved cardiovascular function and a reduced workload on the heart at rest. The efficiency of the respiratory system also improves, as the lungs adapt to enhance oxygen uptake and carbon dioxide expulsion, ultimately supporting more effective energy metabolism. Altogether, these changes contribute to the participant's improved ability to perform prolonged physical activities with less fatigue, highlighting the effectiveness of integrating traditional dance elements into aerobic dance programs for promoting cardiovascular health (Bang & Son, 2016; Nystoriak & Bhatnagar, 2018; Kang et al., 2016).

The improvement in flexibility, as evidenced by the significant increase in sit and reach test scores, indicates that the traditional movement-based exercises incorporated into the aerobic dance sessions provided substantial and beneficial stimulation to the body's major flexor muscle groups, particularly in the hamstrings and lower back regions. This enhancement in flexibility can be attributed to the unique qualities of traditional South Sulawesi dance movements, which are inherently rich in flowing, coordinated, and dynamically structured motion. Unlike rigid or isolated stretching routines, these cultural dance forms involve continuous and expressive movements that require the body to perform a wide range of motions across multiple joints and muscle groups, thereby fostering natural improvements in flexibility. The characteristic postures, transitions, and gestures found in dances like Pakarena and Paduppa often emphasize controlled stretching, bending, lunging, and rotating, which not only engage the targeted muscles effectively but also promote balance and neuromuscular coordination. These dynamic qualities contribute to progressive increases in joint mobility and muscular elasticity when practiced consistently over time. Additionally, the cultural and rhythmic elements embedded within the dance movements help to create a mentally engaging and enjoyable environment, reducing the monotony often associated with conventional static stretching routines. This emotional engagement further supports participant motivation and consistency, which are critical factors for achieving and maintaining flexibility gains. Therefore, traditional dance-based exercises can be seen as a holistic and culturally meaningful approach to flexibility training, offering physical, psychological, and even social benefits that extend beyond mere biomechanical improvement (Konrad et al., 2024; Iwata et al., 2019; Mizuno, 2019).

Integrating traditional dance and music into aerobic dances is proven to be effective in increasing flexibility, particularly in major lower body muscle groups (Kyselovičová & Jankovská, 2024; Douka et al., 2019; Cordun et al., 2021). This improvement is reflected in the sit and reach test results, a standard tool for measuring hamstring and lower back flexibility. The rhythmic and structured movement patterns of traditional South Sulawesi dances align well with the core principles of aerobic dances (Aswan et al., 2023; Arfanda et al., 2022; Latuheru & Arfanda, 2023; Arfanda et al., 2023). Routine training involving traditional movements not only supports physical development but also enriches the emotional and cultural experience of participants (Akbar et al., 2020; Jitdamrong et al., 2024). Significant flexibility improvements

are observed after engaging in traditional dance-based training for 12 weeks (Mavrovouniotis et al., 2016; Argiriadou, E. Mavrovouniotis & Mavrovouniotis, 2018; Malkogeorgos et al., 2020). These results underscore the importance of a holistic approach that combines local cultural elements within modern fitness programs.

In addition to physiological benefits, culture-based approaches also offer substantial psychological and motivational advantages. Participants showed greater enthusiasm and interest in participating in training sessions due to the emotional connection and cultural identity reflected in the activities. This supports the theory that emotional engagement in physical activities enhances adherence to training programs and provides a more enjoyable and meaningful exercise experience (Gurleyik et al., 2022; Delattre et al., 2024). However, this study did not further investigate those aspects.

Thus, integrating local culture into aerobic dances not only promotes physical fitness but also reinforces social, emotional, and cultural values among participants. This research confirms that South Sulawesi local culture-based aerobic dances are an innovative and applicable approach to sustainable public health promotion and cultural preservation.

5 Conclusion

Based on the findings, it can be concluded that South Sulawesi local culture-based aerobic dances significantly improve cardiovascular endurance and flexibility in female participants aged 18–25 years. The integration of traditional movements and music into aerobic dances proves more effective in enhancing cardiopulmonary efficiency and joint range of motion compared to conventional routines. Beyond physiological benefits, this approach also boosts participant motivation and engagement through emotional connection and embedded cultural values. Therefore, this culturally integrated aerobic model is worth developing and implementing as an alternative fitness program that is not only physically beneficial but also socially and culturally meaningful.

References

Adams, V., & Linke, A. (2019). Impact of exercise training on cardiovascular disease and risk. *Biochimica et Biophysica Acta - Molecular Basis of Disease*, *1865*(4), 728–734. https://doi.org/10.1016/j.bbadis.2018.08.019

Akbar, L., Zuk, A. M., & Tsuji, L. J. S. (2020). Health and wellness impacts of traditional physical activity experiences on indigenous youth: A systematic review. *International Journal of Environmental Research and Public Health*, *17*(21), 1–18. https://doi.org/10.3390/ijerph17218275

Arfanda, P. E., Aprilo, I., & Alamsyah, N. F. (2022). Sarana Pengembangan Olahraga Rekreasi : Senam Aerobik Dangdut Berbasis Budaya Lokal Sulawesi Selatan. In *Rekognisi Pendidikan, Olahraga, dan Kesehatan di Masa Endemi Covid-19* (pp. 10–19).

Arfanda, P. E., Aprilo, I., Arimbi, Nurliani, & Wahid, W. M. (2023). Socialization of Aerobic Exercise Based on Culture in South Sulawesi. *J-Abdi Jurnal Pengabdian Kepada Masyarakat*, *3*(6), 104–116.

Argiriadou, E. Mavrovouniotis, F., & Mavrovouniotis, A. (2018). Effect Of A 12-week Greek Traditional Dances Program On The Development Of Kinesthesis And Dynamic Balance In School-Aged Children. *Journal of Education and Culture Studies*, *2*(1), 46. https://doi.org/https://doi.org/10.22158/jecs.v2n1p46

Arwani, S. N. L. A., & Sukamti, E. R. (2024). The Effects of Game-Based Aerobic Gymnastics Element Training on Improving Arm Strength, Balance, and Flexibility in Athletes Aged 7-8 Years Old. *International Journal of Multicultural and Multireligious Understanding*, *11*(6), 86–98.

Aswan, A. M., Dlis, F., Lubis, J., Junaidi, Humaid, H., Widiastuti, Tangkudung, J., Asmawi, & Fikri, A. (2023). South Sulawesi's Padduppa Dance: Improving Physical Fitness for the Elderly. *International Journal of Human Movement and Sports Sciences*, *11*(3), 558–563. https://doi.org/10.13189/saj.2023.110307

Asyrafunnisa, A. (2021). Symbolic Meaning in the Traditional Dance of Bugis Makassar, Pakarena Dance (A Semiotic Study). *Tamaddun*, *20*(1), 26–31. https://doi.org/10.33096/tamaddun.v20i1.88

Bang, D., & Son, Y. (2016). *Effect of intensive aerobic exercise on respiratory capacity and walking ability with chronic stroke patients: a randomized controlled pilot trial*. 2381–2384.

Budiarti, R., Siswantoyo, S., & Sukamti, E. R. (2022). Explosive Power and Muscle Flexibility in Junior Gymnasts of Aerobic Gymnastic Based on Different Sexes. *Proceedings of the Conference on Interdisciplinary Approach in Sports in Conjunction with the 4th Yogyakarta International Seminar on Health, Physical Education, and Sport Science (COIS-YISHPESS 2021)*, *43*, 144–147. https://doi.org/10.2991/ahsr.k.220106.027

Cordun, M., Bratu, M., Minculescu, C., Stoian, O., Ghezea, A., & Hiță, R. C. (2021). The intervention of competitive aerobic gymnastics on body posture. *Discobolul – Physical Education, Sport and Kinetotherapy Journal*, *60*(4), 427–440. https://doi.org/10.35189/dpeskj.2021.60.4.6

Delattre, B., Applewhite, B., Buckman, J. E. J., Harmer, C. J., & Murphy, S. E. (2024). Social dance and movement for mental health: A narrative review. *Mental Health Science*, *2*(2). https://doi.org/10.1002/mhs2.62

Douka, S., Zilidou, V. I., Lilou, O., & Manou, V. (2019). Traditional dance improves the physical fitness and well-being of the elderly. *Frontiers in Aging Neuroscience*, *11*(APR), 1–9. https://doi.org/10.3389/fnagi.2019.00075

Gaspari, V., Bogdanis, G. C., Panidi, I., Konrad, A., Terzis, G., Donti, A., & Donti, O. (2024). The Importance of Physical Fitness Parameters in Rhythmic Gymnastics: A Scoping Review. *Sports*, *12*(9), 248. https://doi.org/10.3390/sports12090248

Greco, F., Grazioli, E., Cosco, L. F., Parisi, A., Bertollo, M., & Emerenziani, G. Pietro. (2022). The effects of music on cardiorespiratory endurance and muscular fitness in recreationally active individuals: a narrative review. *PeerJ*, *10*, 1–14. https://doi.org/10.7717/peerj.13332

Guadagni, V., Drogos, L. L., Tyndall, A. V., Davenport, M. H., Anderson, T. J., Eskes, G. A., Longman, R. S., Hill, M. D., Hogan, D. B., & Poulin, M. J. (2020). Aerobic exercise

improves cognition and cerebrovascular regulation in older adults. *Neurology*, *94*(21), E2245–E2257. https://doi.org/10.1212/WNL.0000000000009478

Gurleyik, D., Sen, C. K. N., Etnier, J. L., & Acar, I. H. (2022). Culture in Physical Activity: The Contribution of Basic Psychological Needs and Goal Orientation. *International Journal of Environmental Research and Public Health*, *19*(24). https://doi.org/10.3390/ijerph192416691

Islami, V. F., & Astuti, K. S. (2023). Aesthetic Value of Padduppa Bugis-Makassar Dance as a Guest Welcoming Dance in South Sulawesi. *International Journal of Multicultural and Multireligious Understanding*, *10*(5), 72. https://doi.org/10.18415/ijmmu.v10i5.4569

Iwata, M., Yamamoto, A., Matsuo, S., Hatano, G., Miyazaki, M., Fukaya, T., Fujiwara, M., Asai, Y., & Suzuki, S. (2019). Dynamic stretching has sustained effects on range of motion and passive stiffness of the hamstring muscles. *Journal of Sport Science and Medicine*, *18*(1).

Jitdamrong, S., Jumpathong, K., Nanglad, C., Ketkaeo, Y., Malicum, D., & Taejarernwiriyakul, O. (2024). *Effectiveness of Online Traditional Exercise Program on the Stress Level of Elderly*. *2024*.

Kang, S. J., Kim, E. H., & Ko, K. J. (2016). Effects of aerobic exercise on the resting heart rate, physical fitness, and arterial stiffness of female patients with metabolic syndrome. *Journal of Physical Therapy Science*, *28*(6), 1764–1768. https://doi.org/10.1589/jpts.28.1764

Konrad, A., Alizadeh, S., Daneshjoo, A., Anvar, S. H., Graham, A., Zahiri, A., Goudini, R., Edwards, C., Scharf, C., & Behm, D. G. (2024). Chronic effects of stretching on range of motion with consideration of potential moderating variables: A systematic review with meta-analysis. *Journal of Sport and Health Science*, *13*(2), 186–194. https://doi.org/10.1016/j.jshs.2023.06.002

Kyselovičová, O., & Zemková, E. (2024). The effects of aerobic gymnastics training on performance-related variables in an elite athlete: a 2-year follow-up study. *Frontiers in Physiology*, *15*(June), 1–11. https://doi.org/10.3389/fphys.2024.1380024

Latuheru, R. V., & Arfanda, P. E. (2023). Aerobic Dance: Facilities for the Development of Physical Education and Recreational Sports. *ACTIVE: Journal of Physical Education, Sport …*, *12*(1). https://doi.org/https://doi.org/10.15294/active.v12i1.60998

Malkogeorgos, A. G., Malkogeorgou, S. A., Argiriadou, E. A., Mavrovouniotis, A. F., & Mavrovouniotis, F. I. (2020). The Effect Of A 24-Week Greek Traditional Dances Program On The Cardiorespiratory Fitness Of Adult People. *European Journal of Physical Education and Sport Science*, *6*(3), 60–77. https://doi.org/10.5281/zenodo.3733824

Mavrovouniotis, A., Argiriadou, E., Mavrovouniotis, F., Mavrovounioti, C., & Deligiannis, A. (2016). Greek dances, aerobic dance and women's psychological health state. *Journal of Physical Education and Sport*, *16*(1), 720–726. https://doi.org/10.7752/jpes.2016.s1117

Mizuno, T. (2019). Effect of different stretch amplitudes of dynamic stretching on joint range of motion. *The Journal of Physical Fitness and Sports Medicine*, *8*(3), 137–142. https://doi.org/10.7600/jpfsm.8.137

Napo, P. (2024). Rhythmic Gymnaastics: Exploring Its Benefits And Contributions In The

World Of Education (A Literature Review). *JUPE : Jurnal Pendidikan Mandala*, *9*(1), 68–76. https://ejournal.mandalanursa.org/index.php/JUPE/article/view/6724

Nystoriak, M. A., & Bhatnagar, A. (2018). Cardiovascular Effects and Benefits of Exercise. *Frontiers in Cardiovascular Medicine*, *5*(September), 1–11. https://doi.org/10.3389/fcvm.2018.00135

Terry, P. C., Karageorghis, C. I., Curran, M. L., Martin, O. V., & Parsons-Smith, R. L. (2019). Effects of Music in Exercise and Sport: A Meta-Analytic Review. *Psychological Bulletin*, *146*(2), 91–117. https://doi.org/10.1037/bul0000216

Veri, N., Faisal, T. I., Khaira, N., Emilda, A. S., Magfirah, M., Mutiah, C., Henniwati, H., Lajuna, L., & Sari, Y. (2022). Regular Gymnastics for Three Weeks Lowers Blood Pressure and Cholesterol Levels in Older Women. *Medical Archives*, *76*(1), 45–48. https://doi.org/10.5455/medarh.2022.76.45-48

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