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THE EFFECT OF AEROBIC GENERAL AND SEX ON PHYSICAL FITNESS

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Abstract
Gymnastics is a very good sport for the body and physical fitness if we do the exercise correctly. This study aims to 1) Improve physical fitness using aerobic exercise, 2) Give effect to the Gymnastics Club KOPKI Jambi City, 3) Provide aerobic exercise treatment to improve physical fitness, 4) Provide aerobic exercise treatment and gender to distinguish the increase in physical fitness. 5) Seeing gender differences to be able to distinguish levels of physical fitness. This experimental study uses a 2x2 factorial design to determine the effect of variables with various main factors, and the combination of variable levels and the effect of interactions between factors on physical fitness levels. With a total sample of 30 men and 30 women aged 20-29 years. Based on the results of the research conducted, the male gender for low impact got the initial test score of 507.7 for the final test of 560.8 then the male high impact on the initial test of 548.2 for the final test of 628, Second, the female gender on the initial low impact test was 439.6 for the final test of 521.4 on the high impact female initial test of 496.9 and the final test was 583.9. Based on the results of research and discussions that have been carried out, it can be understood that: (1). Overall, there is an increase in physical fitness (Vo2Max) at the Jambi City KOPKI Club as evidenced by the significance value smaller than the 0.05 level as shown in the Hypothesis Testing table. (2). There are differences in the increase in physical fitness (Vo2Max) to aerobic exercise and gender at the KOPKI Gymnastics Club Jambi City seen in the number of test results for each group.
Keywords: *Aerobic Gymnastics; Gender; Physical Fitness.*

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INTRODUCTION

Gymnastics is a very good sport for the body and the body if done correctly. Gymnastics Indonesia has a parent organization, the All-Indonesia Gymnastics Association (Persani). According to FIG (International Gymnastics Federation), gymnastics is divided into six groups. Namely, 1) gymnastics, 2) gymnastics, 3) acrobatics, and 4) rhythmic gymnastics (acrobatics). Aerobics), 5)

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Trampoline (trampoline gymnastics), 6) Gymnastics (mixed gymnastics). Gymnastics is done in groups to maintain fitness so that the body is healthy and healthy and independent until old age when free to move independently from others. Based on the FIG gymnastics group, creative gymnastics is included in general gymnastics.

(Putri & Syahrastani, 2018) aerobics is a series of movements that are deliberately chosen according to the rhythm of the music, chosen to produce certain rhythm, continuity, and duration decisions. Aerobic exercise consists of low-impact, high-impact, and mixed-impact movements. Low impact is a movement that uses a moderate rhythm, and the movement does not use jumps. High impact is a movement that uses a fast rhythm and high intensity and uses jumps that aim to increase the intensity and the cardiovascular system (Sitepu et al., 2020). The combination of low and high collisions is called mixed collisions and is carried out rhythmically with low collisions then followed by high collisions. Aerobic exercise is characterized by energetic movements, movements that bring joy and enthusiasm to gymnastics participants. Based on some of the explanations above, aerobics can conclude that systematic body movement is one type of health exercise with the rhythm of music (Puspitorini & Tangkudung, 2022). But in its development, aerobics is not only taught in general in society, but also fought for performance purposes. Aerobic exercise aims to improve the work of the heart and lungs and build the body (Ihsan et al., 2022). Gymnastics is very important to train the immune system, which is beneficial for human survival. Gymnastics as a sport and the basis of other sports.

The better you are, the more effective your work will be. With regular and regular exercise, you can reach your ideal weight and improve your health and fitness. There are various sports activities, including aerobics. Aerobic gymnastics is a series of patterned or unpatterned movements with music that has a certain duration. Aerobic exercise improves the work of the heart, lungs, and good blood circulation, allowing the body to work continuously without excessive fatigue (Eckstrom et al., 2020). Aerobic exercise, on the other hand, helps keep your body

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young and healthy by minimizing fat (Petridou et al., 2019). One of the benefits of aerobic exercise is that it can strengthen the body, optimize the body, and refresh with the required intensity. Aerobics takes 45 to 60 minutes and can be used by anyone from children to the elderly (Okilanda et al., 2021). This is because when you exercise, you must move your body to become a first-class figure. As the researchers have observed, many people still appear tired during their daily activities, but can measure the physical improvements associated with regular strenuous play and exercise (Arisman & Agun Guntara, 2021).

This study describes the results of aerobic exercise (low and high impact) and gender on physical fitness at the Kopuki Club, Jambi City. Physical fitness can be produced by the body through the fulfillment of regular and measurable physical activity and exercise. Physical fitness is the body's ability to work or carry out daily activities without feeling tired, which means that the body is ready to carry out strenuous activities (Bayu et al., 2021). Based on the explanation of the theory, it can be accepted by researchers because the exercises given by researchers have been programmed and measured by giving a portion of exercise as many as 16 meetings and providing low impact aerobics with a beat (speed of songs) of 100-120 bpm then also giving high impact with a beat (song speed) of 130-160 bpm with the same levels for boys and girls (Pahkala et al., 2013). Therefore, it can be concluded that the results of the research on the effect of aerobic exercise and gender on physical fitness at the Jambi City KOPKI Club are acceptable.

Based on the observations of researchers, the fitness level of the KOPKI Gymnastics Club in Jambi city is far from the expectations observed when doing gymnastics, so you feel tired quickly. Therefore, researchers really want to help meet the needs of the community by carrying out the physical activities they experience, participating in aerobic exercise to stay physically fit.

METHOD

The research design is an experimental study that uses 2x2 Factorial Design, which is to determine the effect of variables with several main factors,

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and the combination of variable levels or the effect of interactions between factors on physical fitness levels. (Tantri et al., 2015) the factorial design consists of 2 (3) independent variables and each variable consists of 2 levels. Does each affect the level of the dependent variable. With the level in each of these factors, as well as whether there will be an interaction between the factors if the level is different, on the influence of physical fitness. This 2-variable design has 2 levels which is called a 2×2 factorial design.

Table 1. Factorial Design 2x2 Physical Fitness

Aerobics Gymnastic	Low Impact		High Impact		Total
Sex	Preliminary Test	Final Test	Preliminary Test	Finas Test	
Male	507,7	560,8	548,2	628,2	2244,9
Female	439,6	521,4	496,9	583,9	2041,8
Total	947,3	1082,2	1045,1	1212,1	4286,7

This research was conducted at the Gymnastics Club KOPKI Jambi City which is located at Jl. Perumahan Citraraya City. Ruko Tirta Avenue. Lantai 2 Marketing Point' Muaro, Mendalo Darat, Kec. Jambi Luar Kota, Kabupaten Muaro Jambi. This research was conducted on February 3, 2022 – March 20, 2022. The population in this study were all members of the Jambi City KOPKI who were male and female as many as 75 people. While the sample of this study were 60 people consisting of 30 male and 30 female.

The data collection technique in this study was carried out twice for the fitness test, namely the initial test and the final test. The initial trial was carried out before aerobic exercise, the treatment was carried out for up to 24 sessions with a frequency of 3 times per week and a duration of 40-45 minutes. Then a final test is carried out to compare the previous data with the initial test by comparing the results. The fitness test is used in the form of a multi-stage fitness test (MFT/Bleep test). This test uses a sound sensor based on the MFT guided music (Cooper, 2005). Data analysis technique is the method used to obtain data. This data analysis aims to test the acceptance or rejection of the formulated hypothesis. The data analysis technique used in this study is "factorial test" with the condition that the sample must be homogeneous and normal.

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RESULT AND DISCUSSION

Normality Test

The normality test for VO2 Max data at the KOPKI Club Jambi City was carried out on (1) the overall data for the men's Low Impact aerobic pre-test and post-test, (2) the overall data for the pre-test and the post-test of the High Impact aerobic test for men (3) the overall data for the pre-test. -test and post-test for Women's Low Impact Aerobics (4). Calculation of the complete data normality test can be seen in the attachment. The summary of the results of the normality test for VO2 Max data in the group can be seen in the following table.

Table 2. Normality Test

Group	N	*p* (Sig)	Taraf (Sig)	Description
Male Low Impac	15	0,453	0,05	Normal
Male High Impac	15	0,117	0,05	Normal
Female Low Impac	15	0,076	0,05	Normal
Female High Impac	15	0,216	0,05	Normal

Based on the results of the normality test for all groups, the research data showed that all groups obtained a significance value greater than the significance level value, so it can be concluded that the sample came from a normally distributed population and two-way annova test. can be fulfilled.

Homogeneity Test

Testing The homogeneity test of each group was carried out with the Bartlett test using SPSS24 at a significance level of 0.05. This Bartlett test looks at the test results table to see the M value in the box obtained. In this uniformity test, the researcher checks whether the data results are uniform. If the value of sig > 0.05, then sig < 0.05, then the pre-test and post-test data values are assumed to be uniform. After that, the heterogeneous value data before and after the test were different. The results of the pre-test and post-test Vo2Max homogeneity are listed in the following table.

Table 3. Homogeneity Test

Group	Taraf Sig	Box's M	Sig	Description
Male Low Impac	0,05	0,113	0,741	Homogen
Male High Impac	0,05	0,156	0,698	Homogen
Female Low Impac	0,05	2,220	0,143	Homogen
Female High Impac	0,05	0,594	0,449	Homogen

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Based on the homogeneity test table above, all Vo2Max test group data at the KOPKI Gymnastics Club Jambi City are homogeneous so that all Vo2Max test data can be fulfilled.

Hypothesis Test

In this study using hypothesis testing using (Two Way Anova) with the SPSS 24 application. To test the hypothesis in this study, a comparison between the confidence level value of 0.05 was carried out. If Sig > 0.05 then the research data has no influence or there is no difference, if Sig < 0.05 then the research data has an influence or there is a difference. The calculation results are taken from the SPSS 24 table, namely the *Test of Between Subject Effect* table as follows:

Tabel 4. Hypothesis Test

Keterangan	F_h	Taraf (Sig)	*p*(Sig)	Kesimpulan
Sex	17,607	0,05	0,000	There is a difference
Aerobics Gymnastic	22,131	0,05	0,000	There is a difference
Sex* Aerobics Gymnastic	0,060	0,05	0,806	No interaction

Based on the Vo2Max hypothesis testing table for the KOPKI Gymnastics Club, Jambi City, the data obtained are as follows the gender significance value is 0.000 < 0.05, so it can be concluded that there is a difference based on gender based on the results of the Vo2Max Club KOPKI Jambi City. The significance value of Aerobic Gymnastics (Low Impact and High Impact) is 0.000 < 0.05 so that it can be concluded that there is a difference based on the Vo2Max results of the Jambi City KOPKI Club. The significance value of sex*Aerobic Gymnastics is 0.806 > 0.05, so it can be concluded that there is no interaction between gender and aerobic exercise in determining Vo2Max results at the Jambi City KOPKI Club.

Based on the analysis of hypothesis testing using two-way ANOVA on the SPSS 24 application, there are differences in the results of Vo2Max based on gender and aerobic exercise at the KOPKI Club of Jambi City as evidenced by the results of hypothesis testing in the test table of between subject effect with these differences in results. it can be concluded that there is an influence on the physical fitness (Vo2Max) of the Jambi City KOPKI Club.

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Aerobic exercise has been proven to be very effective in improving physical fitness. Based on the results of the analysis, in the VO2MAX test conducted by members of the Kopuki Club, the average value of the mileage data increased from the results before and after the test. It also shows that the movements they perform have the effect of increasing the fitness of both male and female members. This is also done continuously so that the activities programmed into 16 sessions given by the researchers influence the cardiopulmonary endurance system (VO2 Max) and aerobic exercise influences increasing VO2 Max because it can have a positive adaptive effect.

In this study, we will discuss the results of aerobic exercise (Low Impact and High Impact) and gender on the physical fitness of the Jambi City KOPKI Club. The results of this study refer to the existing theories in theoretical studies (Palar et al., 2015) the body can be strengthened through physical activity and regular movement. Physical fitness is the body's ability to work and perform daily activities without feeling tired. That is, the body is ready for intense activity. Based on the explanation of the theory, it can be accepted by researchers because the exercises provided by researchers have been programmed and measured by giving a portion of exercise as many as 16 meetings and providing low impact aerobics with a beat (speed of songs) of 100-120 bpm then also giving high impact with a beat (song speed) of 130-160 bpm with the same level for boys and girls. Therefore, it can be concluded that the results of the research on the effect of aerobic exercise and gender on physical fitness at the Jambi City KOPKI Club are acceptable. Then the researchers made a comparison with the relevant research belonging to experiments (Agus et al., 2021) the research was successfully carried out with the hypothesis that aerobic exercise affects physical fitness. and there is an effect on temperature during aerobic exercise on physical fitness as well as that done by researchers, researchers succeeded in conducting research because the hypothesis obtained was that there was an effect of gender on physical fitness and there was an influence on aerobic exercise on physical fitness(Arisman & Noviarini, 2021).

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Physical fitness is interrelated with aerobic exercise and gender because aerobic exercise has intensity in songs such as in low impact movements, participants are required to do slow movements with slow music, but the movement of all limbs moves according to the rhythm of the music. Then in high impact movements they are demanded with very fast movements so that the resulting movements are in accordance with a fast rhythm. In low impact and high impact movements, without realizing it, they have made measurable and regular physical activities so that they can physically train men or women. By doing aerobic exercise activities can also improve physical fitness in men and women with exercises carried out by researchers as many as 16 meetings, the physical fitness of men and women can increase, if the exercise is not carried out routinely, the physical fitness of men and women can increase. men and women did not increase.

CONCLUSION

Based on the results of the study, it can be concluded that overall, there is an increase in physical fitness at the Jambi City KOPKI Club as evidenced by the significance value smaller than the 0.05 level seen in the Hypothesis Testing table and there is a difference in increasing physical fitness to aerobic exercise and other types of exercise. Gender at the Gymnastics Club KOPKI Jambi City can be seen in the number of test results for each group. Therefore, there is an increase in physical fitness by using aerobic exercise by also distinguishing gender. Researchers must also be able to increase from the existing population and sample so that the improvements that occur can be useful and visible to the community.

The study conducted is an experimental study that can use the results of the study as a criterion in considering or determining aerobic exercise (low and high impact) and gender and must be applied to a sports education environment. In addition, it is hoped that it will reduce the problems faced by stakeholders in the field during the exercise. We can be sure that the results of this study have positive implications for those involved. From the problems that researchers have observed in this field, the results of the research have a direct impact on the

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intended party. For research that can be discussed in the pretest section, the results obtained are not optimal. This means that affected people need new and exciting forms of exercise to improve their fitness.

The disclosure of the results of this study on physical fitness can strengthen a statement that the Jambi City KOPKI Gymnastics Club is very responsive to the form of exercise presented by the researcher. Therefore, after the students of the Jambi City KOPKI Club did their exercises, they were given the motivation to maintain their modern fitness at the end of each exercise.

REFERENCES

Agus, A., Sepriadi, & Mukhtarsyah, F. (2021). The Effect of Aerobic Exercises on Students' Physical Fitness. *Proceedings of the 1st International Conference on Sport Sciences, Health and Tourism (ICSSHT 2019)*. https://doi.org/10.2991/ahsr.k.210130.037

Arisman, A., & Agun Guntara, R. (2021). The Research Of Students' Motor Ability In Archery Extracurricular. *Jurnal Maenpo : Jurnal Pendidikan Jasmani Kesehatan Dan Rekreasi*, *11*(1), 13. https://doi.org/10.35194/jm.v11i1.1216

Arisman, A., & Noviarini, T. (2021). Tabata Workout dalam Meningkatkan Kebugaran Atlet Panahan. *Halaman Olahraga Nusantara (Jurnal Ilmu Keolahragaan)*, *4*(1), 12–22.

Bayu, W. I., Destriana, D., Victorian, A. R., Yusfi, H., & Solahuddin, S. (2021). Fitness Level Effect On The Grade-Point Average Of Physical Education Major Students. *Halaman Olahraga Nusantara (Jurnal Ilmu Keolahragaan)*, *4*(2), 180. https://doi.org/10.31851/hon.v4i2.5239

Cooper, S.-M. (2005). The repeatability and criterion related validity of the 20 m multistage fitness test as a predictor of maximal oxygen uptake in active young men. *British Journal of Sports Medicine*, *39*(4), e19–e19. https://doi.org/10.1136/bjsm.2004.013078

Eckstrom, E., Neukam, S., Kalin, L., & Wright, J. (2020). Physical Activity and Healthy Aging. *Clinics in Geriatric Medicine*, *36*(4), 671–683. https://doi.org/10.1016/j.cger.2020.06.009

Ihsan, N., Okilanda, A., Donie, D., Putra, D. D., Wanto, S., & Arisman, A. (2022). Practical Group Defense Exercise Design in Football Game for 13-Year-Old Students. *Teorìâ Ta Metodika Fìzičnogo Vihovannâ*, *22*(2), 194–201. https://doi.org/10.17309/tmfv.2022.2.07

Okilanda, A., Dlis, F., Humaid, H., Putra, D. D., Arisman, A., & Muslimin, M.

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Accredited SINTA 3

(2021). Defense Warm-Up Exercise Material for 13-Age Athlete Using Video Technology in Covid-19 Era. *International Journal of Human Movement and Sports Sciences*, *9*(4), 629–634. https://doi.org/10.13189/saj.2021.090404

Pahkala, K., Hernelahti, M., Heinonen, O. J., Raittinen, P., Hakanen, M., Lagström, H., Viikari, J. S. A., Rönnemaa, T., Raitakari, O. T., & Simell, O. (2013). Body mass index, fitness and physical activity from childhood through adolescence. *British Journal of Sports Medicine*, *47*(2), 71–76. https://doi.org/10.1136/bjsports-2011-090704

Palar, C. M., Wongkar, D., & Ticoalu, S. H. R. (2015). MANFAAT LATIHAN OLAHRAGA AEROBIK TERHADAP KEBUGARAN FISIK MANUSIA. *Jurnal E-Biomedik*. https://doi.org/10.35790/ebm.3.1.2015.7127

Petridou, A., Siopi, A., & Mougios, V. (2019). Exercise in the management of obesity. *Metabolism: Clinical and Experimental*, *92*, 163–169. https://doi.org/10.1016/j.metabol.2018.10.009

Puspitorini, W., & Tangkudung, J. (2022). Rhythm Gymnastics Modification Model for Family Fitness During The Covid 19 Pandemic. *Halaman ...*, *5*(2), 414–423. https://doi.org/10.31851/HON.V5I2.7764

Putri, E. P., & Syahrastani, S. (2018). Pengaruh Senam Aerobik Mix Impact Terhadap Penurunan Kadar Lemak Tubuh. *Sport Science*, *18*(2), 71–82. https://doi.org/10.24036/jss.v18i2.19

Sitepu, M. S. Z., Tangkudung, J., & Puspitorini, W. (2020). Pengaruh Latihan Senam Aerobik Dan Motivasi Berolahraga Terhadap Penurunan Persentase Lemak Tubuh. *Penjaskesrek Journal*, *7*(1), 45–59. https://doi.org/10.46244/penjaskesrek.v7i1.1008

Tantri, G. K. D., Widiharih, T., & Wuryandari, T. (2015). Analisis desain faktorial fraksional 2. *Jurnal Gaussian*, *4*(3), 497–505.