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Traditional strength training with low row kinesis exercise improving muscle strength and power arm in male students

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Abstract

This study aims to prove the effect of traditional strength training with low row kinesis exercise on increasing muscle strength and arm power in male students. This study uses a pre-experimental method with one group pretest posttest design. A total of 10 adolescent males, aged 20-21 years, and without a history of heart disease were involved in the study and given a traditional strength training intervention with kinesis low row for 6 weeks then muscle strength and power arm measurements were carried out between before and after the intervention. Statistical analysis uses paired sample t-test with a significant level of 5%. The results showed a significant increase in muscle strength between before and after the intervention (21.30±5.91 to 32.65±9.38 kg, p=0.005) and has a large effect size with a Cohen's d value of 1.449. We also observed an increase in power arm between before and after the intervention (178.46±31.84 to 236.96±49.65 kg, p=0.019) and has a large effect size with a Cohen's d value of 1.403. These findings prove that the traditional strength training with low row kinesis exercise intervention for 6 weeks is effective in increasing muscle strength and arm power in male students.

Keywords: Low row kinesis; Muscle strength; Physical performance; Power arm

1. Introduction

The application of weight training in sports is increasing year by year with an increasing number of approaches and methods (McQuilliam et al., 2020; Fossmo & van den Tillaar, 2022). Especially the training approach to improve the physical performance of athletes and people who just want to improve their fitness (Nekar et al., 2022). Currently, there are three training approaches that are widely used by the community, namely traditional strength training, kinesis, and suspension training (Angler et al., 2020; Santos et al., 2022). All of the above exercise approaches are modern versions that can help improve a person's physical performance. In addition, the above training approaches have their own advantages, so they can be chosen according to the user's wishes, the form of movement, and the nature is also different.

Traditional strength training is a tool to increase a person's strength with constant movements, an approach with this tool is often called the old version approach (Balachandran et al., 2022). This approach can only train one muscle group during the training period given that several other parts of the body are activated to maximize the desired muscle gain results (Zuo et al., 2022). Therefore, users who want to get training with multiple muscles in both the upper and lower extremities need to do training in several places or with a circuit training pattern (Balachandran et al., 2022).

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Kinesis low row is a development of traditional strength training equipment that has advantages compared to the previous one, this tool uses weight training combined with movement. The advantage of this tool lies in the fact that the subject is able to maximize the function of gestures, such as reaching, squatting, and bending. The nature of the exercise has more advantages or benefits in improving a person's performance, because in one tool it can train several physical aspects and muscle targets including the latissimus, biceps, trapezius and deltoid muscles (Dawes, 2017). This advantage has more impact on improving the quality of one's movements. In contrast to the old version of the tool which only pursues the quantity of movement at the time of its application. In addition, low-row kinesis exercises can objectively set goals on the subject's motion quality. Given the many advantages above, it should be noted that low row kinesis can also adapt exercises including functional, sport specific preparation, postural improvement and core stability.

Based on the results of the Edelburg (2017) study, it is explained that kines low row training has a positive impact on increasing muscle activation in the middle trapezius. Henning et al. (2016) emphasized that the middle trapezius can help strengthen the shoulder, so that it can contribute to increasing the movement of power and strength of the shoulder muscles, where the shoulder is the main muscle as the driving arm in the execution of the throw. The results of the study Mate-Munoz et al. (2014) explained that traditional strength training increased the average and peak power of the arm more than instability resistance training.

Based on the types of exercises above, it shows the development of sports science that provides variety and application of training programs. Considering that variety and exercise programs are important factors in improving performance to make the exercises carried out effective. Therefore, this study aims to prove the effect of traditional strength training with low row kinesis exercise on increasing muscle strength and power arm in male students

2. Material and methods

This study uses a pre-experimental method with one group pretest posttest design. A total of 10 adolescent males, aged 20-21 years, and without a history of heart disease were involved in the study and given a traditional strength training intervention with kinesis low row for 6 weeks then muscle strength and power arm measurements were carried out between before and after the intervention.

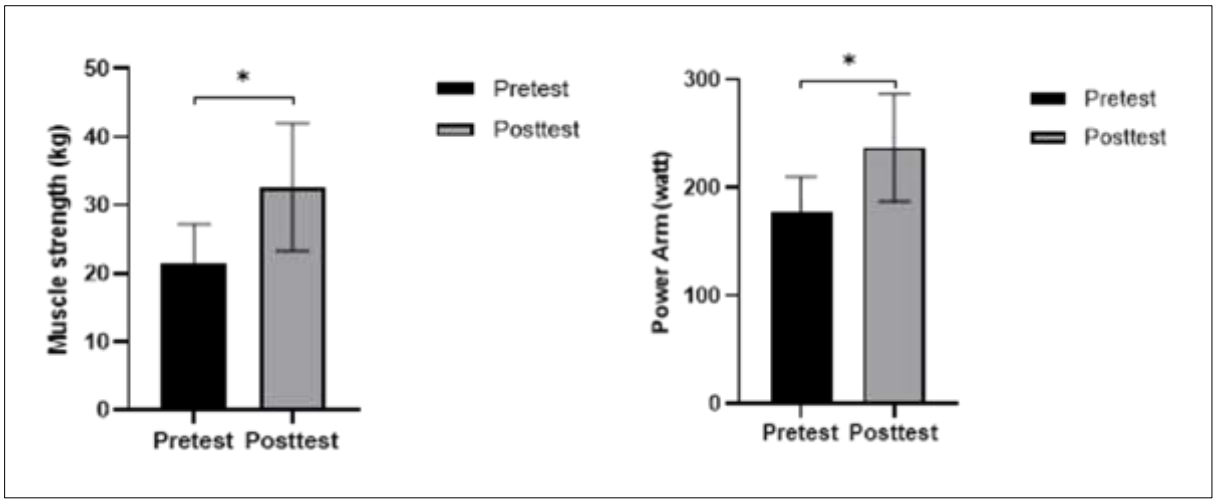
Traditional strength training with kinesis low row was a form of hanging model training with a straight body position back forming a 45-degree angle and the position of both hands straight by pulling the handle. Kinesis low row was performed with an intensity of 80-85% 1RM, 3-5 sets of 6 reps, frequency 3x/week for 6 weeks.

Data collection was carried out by measuring muscle strength using an expanding dynamometer with one kg measurement (Putera et al., 2023), while the power arm was measured using a Medicine Ball (3 kg) with a unit of measurement of watts (Wijaya et al., 2024). Muscle strength and power arm measurements were performed between before (0 weeks) and after (6 weeks) the traditional strength training with kinesis low row intervention.

The data analysis technique begins with a descriptive test to determine the mean value and standard deviation. The normality test was applied with the Shapiro–Wilk test to find out whether the observed data had a normal distribution or not. The parametric test was applied by paired sample t-test analysis with a significant level of 5%. Meanwhile, the evaluation of the effect size used Cohen's D for T-Test (Wiriawan et al., 2024). Cohen classified effect sizes as small ($d = 0.2$), medium ($d = 0.5$), and large ($d \geq 0.8$) (Sullivan & Feinn, 2012).

3. Results

Based on the results of the study, there was a significant increase in muscle strength between before and after the intervention (21.30±5.91 to 32.65±9.38 kg, $p=0.005$) and has a large effect size with a Cohen's d value of 1,449. We also observed an increase in power arm between before and after the intervention (178.46±31.84 to 236.96±49.65 kg, $p=0.019$) and has a large effect size with a Cohen's d value of 1.403. For more details, the increase in muscle strength and power arm can be seen in Figure 1.



Description: (*) Significant at pretest ($p \leq 0.05$). p-value was obtained by paired sample t-test. Presentation of data as mean ± standard deviation (SD).

Figure 1 The results of muscle strength and power arm analysis between pretest and posttest

4. Discussion

This study aims to prove the effect of traditional strength training with low row kinesis exercise on increasing muscle strength and arm power in male students. These findings prove that the traditional strength training with low row kinesis exercise intervention for 6 weeks is effective in increasing muscle strength and arm power in male students. These results are in line with a systematic review report and meta-analysis from Behm et al. (2017) which reported an increase in muscle strength and power after traditional strength interventions. Strength training often combines closed-kinetic-chain exercises (CKCEs) has also been reported to increase muscle strength (Dannelly et al., 2011). Ratamess (2011) explained that effective exercises to increase muscle strength and power can be done for 4-8 weeks. Therefore, it can be concluded that training for 4-8 weeks with a systematic and programmed muscle strength and power training program can have an effect on increasing muscle strength and power.

Low row kinesis exercises significantly increased muscle strength by 11.35 kg. This shows that the muscle strength generated by kinesis exercises has increased by more than 50% from the baseline value. The advantage obtained from kinesis training is that it can improve strength, balance and agility in all movement patterns. As well as being able to train the upper and lower body with external loads, thereby increasing the pulse rate by about 30% which has an impact on burning large calories than traditional strength training. So it can be said to be effective for the application of strength training using low row kinesis tools.

Low row kinesis exercises were also reported to significantly increase arm power by 58.5 watts. This increase is the smallest increase between the two types of exercises applied. This is due to several factors, including movements that are applied slowly so that only increasing strength has a large increase and the movements that are trained do not contribute to the muscles when doing an arm power test. In addition, kinesis exercises that include instability training affect the joints in moving to be slightly stiff which has an impact on limiting the acquisition of power, strength and speed of movement (Carpenter et al., 2001).

5. Conclusion

Based on the results of the study, it was found that traditional strength training with low row kinesis exercise carried out for 6 weeks was proven to be effective in increasing muscle strength and power arm in male students.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Angleri, V., Soligon, S. D., da Silva, D. G., Bergamasco, J. G. A., & Libardi, C. A. (2020). Suspension Training: A New Approach to Improve Muscle Strength, Mass, and Functional Performances in Older Adults?. Frontiers in physiology, 10, 1576. https://doi.org/10.3389/fphys.2019.01576.

[2] Balachandran, A. T., Steele, J., Angielczyk, D., Belio, M., Schoenfeld, B. J., Quiles, N., Askin, N., & Abou-Setta, A. M. (2022). Comparison of Power Training vs Traditional Strength Training on Physical Function in Older Adults: A Systematic Review and Meta-analysis. JAMA network open, 5(5), e2211623. https://doi.org/10.1001/jamanetworkopen.2022.11623.

[3] Behm, D. G., Young, J. D., Whitten, J. H. D., Reid, J. C., Quigley, P. J., Low, J., Li, Y., Lima, C. D., Hodgson, D. D., Chaouachi, A., Prieske, O., & Granacher, U. (2017). Effectiveness of Traditional Strength vs. Power Training on Muscle Strength, Power and Speed with Youth: A Systematic Review and Meta-Analysis. Frontiers in physiology, 8, 423. https://doi.org/10.3389/fphys.2017.00423.

[4] Carpenter, M. G., Frank, J. S., Silcher, C. P., & Peysar, G. W. (2001). The influence of postural threat on the control of upright stance. Experimental brain research, 138(2), 210–218. https://doi.org/10.1007/s002210100681.

[5] Dannelly, B. D., Otey, S. C., Croy, T., Harrison, B., Rynders, C. A., Hertel, J. N., & Weltman, A. (2011). The effectiveness of traditional and sling exercise strength training in women. Journal of strength and conditioning research, 25(2), 464–471. https://doi.org/10.1519/JSC.0b013e318202e473.

[6] Dawes, J. (2017). Complete guide to TRX suspension training. United States of America. Human Kinetics.

[7] Edelburg, H. R., (2017). Electromyographic Analysis of The Back During Various Back Exercises. College of Science and Health Clinical Exercise Physiology.

[8] Fossmo, J. E., & van den Tillaar, R. (2022). The Effects of Different Relative Loads in Weight Training on Acceleration and Acceleration from Flying Starts. Sports (Basel, Switzerland), 10(10), 148. https://doi.org/10.3390/sports10100148.

[9] Henning, L., Plummer, H., & Oliver, G. D. (2016). Comparison of Scapular Muscle Activations During Three Overhead Throwing Exercises. International journal of sports physical therapy, 11(1), 108–114.

[10] Maté-Muñoz, J. L., Monroy, A. J., Jodra Jiménez, P., & Garnacho-Castaño, M. V. (2014). Effects of instability versus traditional resistance training on strength, power and velocity in untrained men. Journal of sports science & medicine, 13(3), 460–468.

[11] McQuilliam, S. J., Clark, D. R., Erskine, R. M., & Brownlee, T. E. (2020). Free-Weight Resistance Training in Youth Athletes: A Narrative Review. Sports medicine (Auckland, N.Z.), 50(9), 1567–1580. https://doi.org/10.1007/s40279-020-01307-7.

[12] Nekar, D. M., Kang, H. Y., & Yu, J. H. (2022). Improvements of Physical Activity Performance and Motivation in Adult Men through Augmented Reality Approach: A Randomized Controlled Trial. Journal of environmental and public health, 2022, 3050424. https://doi.org/10.1155/2022/3050424.

[13] Putera, S. H. P., Setijono, H., Wiriawan, O., Nurhasan, Muhammad, H. N., Hariyanto, A., Sholikhah, A. M., & Pranoto, A. (2023). Positive Effects of Plyometric Training on Increasing Speed, Strength and Limb Muscles Power in Adolescent Males. Physical Education Theory and Methodology, 23(1), 42–48. https://doi.org/10.17309/tmfv.2023.1.06.

[14] Ratamess, N. (2011). ACSM's foundations of strength training and conditioning. USA: Indianapolis.

[15] Santos, C. S., Pinto, J. R., Scoz, R. D., Alves, B. M., Oliveira, P. R., Soares, W. J., DA Silva Jr, R. A., Jr, Vieira, E. R., & Amorim, C. F. (2022). What is the traditional method of resistance training: a systematic review. The Journal of sports medicine and physical fitness, 62(9), 1191–1198. https://doi.org/10.23736/S0022-4707.21.12112-7.

[16] Sullivan, G. M., & Feinn, R. (2012). Using Effect Size-or Why the P Value Is Not Enough. Journal of graduate medical education, 4(3), 279–282. https://doi.org/10.4300/JGME-D-12-00156.1.

[17] Wijaya, F. J. M., Nurkholis, N., Suyoko, A., Bulqini, A., Subagio, I., & Pranoto, A. (2024). The relationship between physical condition and achievement rankings of East Java gymnastics athletes. Retos, 61, 636–643. https://doi.org/10.47197/retos.v61.109794.

[18] Wiriawan, O., Setijono, H., Putera, S. H. P., Yosika, G. F., Kaharina, A., Sholikhah, A. M., & Pranoto, A. (2024). Far-Infrared Radiation with Sauna Method Improves Recovery of Fatigue and Muscle Damage in Athletes After Submaximal Physical Exercise. Retos, 54, 57 62. https://doi.org/10.47197/retos.v54.102938.

[19] Zuo, C., Bo, S., Wang, T., & Zhang, W. (2022). Functional and Traditional Resistance Training Are Equally Effective in Increasing Upper and Lower Limb Muscular Endurance and Performance Variables in Untrained Young Men. Frontiers in physiology, 13, 868195. https://doi.org/10.3389/fphys.2022.868195.