

## **Analysis of Hand and Leg Squeezing Muscle Strength in UNIBA Students Class 2022 Class A**

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### **Abstract**

This study aims to analyze the level of strength of the squeezing muscles and leg muscles in students of PGRI Banyuwangi University class A class of 2022, as well as how these strengths support their performance in daily physical activities. This study uses a quantitative descriptive method with data collection through strength tests using hand grip and back and leg dynamometers. The research sample consisted of all students in class 22A. The results of measuring the strength of the hand squeeze muscles showed that (31.6%) of male students were in the "good" category, while (15.8%) female students were in the same category. Measurements of leg muscle strength showed that most male and female college students were in the "less" or "less" category. These findings show that there is a need to increase muscle strength, especially in the leg muscles, so that students can have optimal physical performance in daily activities.

**Keywords:** muscle strength; components of physical condition; leg muscles; hand squeeze muscles

### **INTRODUCTION**

Exercise is a physical activity that is useful for maintaining physical fitness, but not only that, exercise also provides benefits for mental and emotional health. Physical activity in the form of sports has a very important role in increasing endurance and improving blood circulation. According to (Aditia, 2015) Exercise is a form of physical activity that aims to maintain and improve a person's health after doing physical activity. According to (Subekti et al., 2021) Exercise is a physical movement that affects the entire body. Where the word sports is taken from the Javanese language, namely sports, and sports with the meaning of processing the body with physical movements that affect all limbs.

Sport is an important aspect of human life in harmony with what is said by (Zubaida et al., 2022), Exercise is an important way to stay healthy. In addition, sports are also a means of self-development, as they help individuals develop discipline, cooperation, and responsibility. In exercising, physical condition is an important aspect that must be considered. According to (Supriyoko & Mahardika, 2018) Physical condition is an important component that can support the achievement of athletes, a person's physical condition is composed of components of physical condition.

Each of these components contributes to an improvement in overall body performance. According to (Arjuna, 2019), the main physical factors measured include strength, muscle endurance, speed, agility, flexibility, power, and basic endurance (cardiovascular). From this statement, there are seven main components of the body's physical condition, these components must be

understood so that the reader can sort and choose which physical condition component is in accordance with the sport that is pursued so that exercising not only healthy but achievements can also be achieved.

Among these physical components, muscle strength plays a very vital role. According to (2018) explained that strength is a component that humans need to carry out daily activities. Muscle strength is the basic foundation that allows athletes to move the body with maximum control and power, especially when facing resistance or weight. In various sports, good muscle strength allows athletes to maintain stability, control movements precisely, and generate strong thrust. According to (Aditya & Dewi, 2020) Muscle strength is one of the main components of physical condition, which plays a huge role in supporting various daily activities and various sports.

Among the various muscle groups in the body, the squeeze muscles of the hands and leg muscles are the parts that often receive attention in the development of strength. The squeezing muscles of the hands have an important role in supporting activities that involve the ability to grasp or hold objects. According to (Suryadi 2018) in his research defines the hand squeeze muscles as muscles that play an important role in producing grip strength. Optimal hand squeeze muscle strength allows individuals to perform activities with greater precision and control.

In addition, leg muscles also play an important role in supporting body movements, because the strength of the leg muscles will affect a person's ability to maintain balance, jump, and move dynamically. According to (Saputra and Kurniawan, 2020), leg muscles are a collection of large muscles in the legs that function to produce power and stability. With the above statements, both muscles have their respective roles which of course can support daily physical activities and by increasing the strength of the squeeze muscles of the hands and leg muscles, a person can optimize his physical performance and increase the effectiveness of movements.

Differences in muscle strength levels in each individual can have an impact on their physical ability to carry out various physical activities. Therefore, analysis is needed to understand the strength level of the squeezing muscles of the hands and leg muscles, in order to obtain more in-depth information about how these muscles play a role in supporting physical activity. Based on the above explanation, the researcher can formulate "What is the level of strength of the squeezing muscles and leg muscles in PGRI Banyuwangi University students class A class of 2022 in supporting their performance in daily physical activities?"

## **METHOD**

This type and design of writing uses quantitative description. The test and measurement were carried out at PGRI Banyuwangi University in October 2024 with the research subject being a group of PJKR students batch 22A. Samples were taken from all students of class 22A. The data collection instrument used hand grips and also back and leg dynamometers, while the average calculation used test norms on the squeeze muscles of the hands and legs. The norms for the strength test of the muscles of the hands and legs

Table 1. Norms of hand squeeze muscles ( Tino et al., 2021)

	Classification	Men	Woman
1.	Very good	> 55.50	> 41.50
2.	Good	46,50 - 55,00	32,50-41,00
3.	Keep	36,50 - 46,00	24,50-32,0
4.	Less	27,50 - 36,00	18,50-24,00
5.	Less than once	< 27.00	< 18.00

Table 2. Norms of Leg Muscle Strength Test for Men (Husen & Rahmat, 2022)

	Norm	Value (kg)
1	Very good	259 and above
2	Very good	187.50 – 159.50
3	Keep	127.50 – 187.50
4	Less	84.50 – 127.50
5	Less	84.50 and below

Table 3. Norms of Leg Muscle Strength Test for Women (Husen & Rahmat, 2022)

	Norm	Value (kg)
1	Very good	219 and above
2	Very good	171.50 – 219.50
3	Keep	127.50 – 171.50
4	Less	81.50 – 127
5	Less	81 and below

## RESULT

The following is a list of the results of the grip test for students of class 22 A.

Table 4. Results of Hand Squeezing Muscle Measurement

	category	Son	Daughter
1.	Very good	-	-
2.	Good	6 students	3 students
3.	Keep	5 students	2 students
4.	Not good	-	3 students
5.	Very less	-	-

Based on the results of the above data obtained from the hand grip test of class 22 A students, it can be concluded that the grip ability of class 22 A students, in male students (31.6%) have hand squeeze muscle strength in the "good" category, and (26.3%) in the "poor" category. On the other hand, female college students showed more mixed results, with (15.8%) in the "good" category, (10.5%) in the "moderate" category, and (15.8%) in the "not good" category. This data indicates that male students tend to have higher hand-squeeze muscle strength compared to female students.

Table 5. Results of measuring the strength of male leg muscles

	Classification	Standard Values	Number of students
1.	Excellent	259 and above	-
2.	Good	187.50 – 159.50	-
3.	Keep	127.50 – 187.50	-
4.	Less	84.50 – 127.50	7
5.	Less than once	84.50 and below	4

Table 6. Results of measuring the strength of women's leg muscles

	Classification	Standard Values	Number of students
1.	Excellent	219 and above	-
2.	Good	171.50 – 219.50	-
3.	Keep	127.50 – 171.50	-
4.	Less	81.50 – 127	-
5.	Less than once	81 and below	8

From the collection of leg muscle strength data on 19 students using *back and leg dynamometers*, it was found that the majority of students had suboptimal strength levels. A total of 7 male students (36.8%) were classified as "less," and 4 male students (21.1%) were classified as "less than once." Meanwhile, 8 female students (42.1%) were also in the category of "very little" in terms of leg muscle strength. These findings show that the majority of college students have inadequate leg muscle strength.

## DISCUSSION

Based on the results of measuring the strength of the grip muscles of the hands and leg muscles of class 22 A students, it was found that there was a significant difference between male and female students. This difference is closely related to the importance of muscle strength in supporting physical performance, especially in sports such as badminton which require strength and agility. As explained (Arif & Wiriawan, 2022) his research, he explained that tests such as tests are indeed needed to find out the physical condition of badminton athletes who will compete. Align with (Raharja, 2023) Applying the test in a structured manner will be able to determine the development of athletes so that the coach can determine the training program for the next.

The results of the measurement showed that male students were more dominant in the "good" category for hand grip strength compared to female students. A total of 31.6% of male students are in the "good" category, while only 15.8% of female students are in this category. In addition, 26.3% of male students were in the "moderate" category, indicating that there were a number of male students who still needed to increase the strength of the hand squeeze muscles. On the other hand, there were 15.8% of female students were classified as "not good," which showed that the hand grip strength of female students tended to be lower than that of men. (Digantara et al, 2020) Explained that the strength of the squeezing muscles of the hands and legs greatly affects the accuracy of the smash of badminton athletes.

The results of the leg muscle measurement showed that 36.8% of male students were in the "less" category, while 21.1% were in the "less than once" category. This shows that the majority of male students have leg muscle strength that is not optimal. According to (Oktora et al., 2024) Less than optimal leg muscle strength will affect landing in a badminton smash. In contrast, more female students had low leg muscle strength, with 42.1% falling into the category of "less than once." Low leg muscle strength has the potential to affect performance in sports that require explosive movements, such as jumps and quick changes of direction in badminton. As explained by (Saputra & Purnomo, 2021) The physical condition of weak athletes will affect the performance of athletes in the match. (Iksal et al., 2023) It also explains the relationship between the condition of leg muscle strength and eyes in a volleyball smash.

These results show the need to increase the strength of the squeezing muscles of the hands and legs, especially for students who fall into the category of "less" or "less." Exercise programs that focus on strengthening muscles, such as weight training and resistance training, can help improve the strength of the squeeze muscles of the hands and legs.

## **CONCLUSION**

Based on the results of measuring the strength of the grip muscles and leg muscles of class 22 A students, it can be seen that there is a difference in ability between male and female students. Male college students tended to have better hand-squeeze muscle strength than female college students, as evidenced by the high percentage in the "good" category. Even so, leg muscle strength is still a challenge for most students, both boys and girls, with the majority in the "less" or "less" category.

Low muscle strength, both in the hands and legs, indicates that most students have not achieved optimal muscle fitness to support maximum performance, especially in sports that rely on strength and agility such as badminton. Therefore, students are advised to take part in an exercise program that focuses on strengthening the muscles of the hands and legs so that their performance in physical activities and sports can improve.

These results can also be used as a reference to develop a more effective physical training program that suits the needs of students so that it can help them achieve better physical abilities in sports.

## **REFERENCES**

- Aditia, D. A. (2015). Survei Penerapan Nilai-Nilai Positif Olahraga Dalam Interaksi Sosial Antar Siswa Di Sma Negeri Se-Kabupaten Wonosobo Tahun 2014/2015. *E-Jurnal Physical Education*, 4(12), 2251–2259.
- Aditya, V. S., & Dewi, C. (2020). Hubungan Kekuatan Otot Tungkai Terhadap Keterampilan Lari Jarak Pendek (Sprint) Pada Siswa Kelas 5 Sd Negeri 62 Kota Bengkulu. *Journal Of Dehasen Educational Review*, 1(1), 50–55. <https://doi.org/10.33258/jder.v1i1.980>
- Arif, M. F., & Wiriawan, O. (2022). Analisis Kondisi Fisik Atlet Bulutangkis Putra Porprov Situbondo Tahun 2022. *JPO: Jurnal Prestasi Olahraga*, 5(8), 70–80.
- Arjuna, F. (2019). Gambaran Komponen Fisik Predominan (Komponen Fisik

- Dasar) Pelatih Sso Real Madrid Fik Uny Tahun 2016. *Jurnal Ilmu Keolahragaan*, 2(1), 47. <https://doi.org/10.26418/jilo.v2i1.32627>
- Husen, J., & Rahmat, Z. (2022). Hubungan Kekuatan Otot Tungkai Dengan Kemampuan Tendangan Lurus Pada Atlet Silat Binaan Koni Aceh Tahun 2021. *Jurnal Ilmiah Mahasiswa Pendidikan*, 3(2).
- Iksal, M., Kahar, I., Nur, S., Ahmad, A., & Hidayat, R. (2023). Pengaruh Kekuatan Otot Tungkai, Kekuatan Otot Lengan Dan Koordinasi Mata Tangan Terhadap Ketepatan Smash Bola Voli. *Jurnal Pendidikan Olah Raga*, 12(1), 11–29. <https://doi.org/10.31571/jpo.v12i1.4745>
- Martini, M. (2018). Kontribusi Antara Kekuatan Otot Tungkai Dan Kekuatan Otot Punggung Terhadap Kemampuan Bantingan Pinggang Olahraga Gulat Atlet Pgsi Provinsi Bengkulu. *Jorpres (Jurnal Olahraga Prestasi)*, 14(2), 108–120. <https://doi.org/10.21831/jorpres.v14i2.23822>
- Oktora zanip, rusdiana agus, hidayat ikhwan iwa. (2024). *Pengaruh Kelelahan Otot Tungkai Atau Lower Body Terhadap Parameter Kinematika Landing Pada Atlet Badminton*. 5(2), 434–442.
- Raharja, D. S. P. (2023). Hubungan Power Otot Lengan, Power Otot Tungkai dan Fleksibilitas Pergelangan Tangan dengan Hasil Jumping Smash dalam Permainan Bulutangkis. *Jurnal Kepelatihan Olahraga*, 15(1), 28–34. <https://doi.org/10.17509/jko-upi.v15i1.54045>
- Saputra, G. G., & Purnomo, M. (2021). Analisis Kondisi Fisik Atlet Bulutangkis Putri KONI Sidoarjo dalam menghadapi PORProv ke VI 2019. *Jurnal Prestasi Olahraga*, 4(4), 71–78.
- Subekti, N., Mulyadi, A., Mulyana, D., & Priana, A. (2021). Peningkatan Kesehatan Melalui Program Informal Sport Masa Pandemi Covid 19 Menuju New Normal Pada Masyarakat Dsn. Kalapanunggal Dan Dsn. Ancol Kec. Sindang Kasih Kab. Ciamis. *Jurnal Pengabdian Siliwangi*, 7(1). <https://doi.org/10.37058/jsppm.v7i1.2503>
- Supriyoko, A., & Mahardika, W. (2018). Kondisi Fisik Atlet Anggar Kota Surakarta. *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran*, 4(2), 280. [https://doi.org/10.29407/js\\_unpgri.v4i2.12540](https://doi.org/10.29407/js_unpgri.v4i2.12540)
- Tino, R., hayati, H., & Pieter Pelamonia, S. (2021). Analisis Deskriptif Kekuatan Otot Peras Tangan. *Jurnal Porkes*, 4(1), 32–38. <https://doi.org/10.29408/porkes.v4i1.3438>
- Zubaida, I., Fernanda, R. A., & Firdaus, W. W. N. (2022). Olahraga Kesehatan : Memasyarakatkan Olahraga Untuk Peningkatan Kesehatan. *Journal of Sport Science and Tourism Activity (JOSITA)*, 1(1), 11. <https://doi.org/10.52742/josita.v1i1.15422>