

Type of Paper: Article

The Effect of Rest Between Sets on The Repetition of a Women's Bench Press

Rendy Herdiansyah*, Agus Rusdiana, Badruzaman Badruzaman, Iman Imanudin, Ahmad Hamidi

Universitas Pendidikan Indonesia, Faculty of Sports and Health Education, Sport Science Study Program, Bandung, West Java Indonesia

*Corresponding Author: rendyherdiansyah@upi.edu

Received: 2022-02-21. Accepted: 2022-05-23. Published: 2022-07-31.

Abstract. This study aims to determine the effect of the rest between sets on the number of repetition for bench press using power method in women. The method used is Poor Experimental with The One-Group Pretest-Posttest Design. The sample in this study were active students of Sport Science FPOK UPI with a total sample of 10 people. The sampling technique used purposive sampling. The instrument used was a free weight bench press to calculate the number of repetitions. The results of data analysis showed that there was an effect of rest on the reduction in the number of repetition, at rest 2 minutes and 3 minutes, except at rest 5 minutes. *K-Independent Samples* test showed that there was a difference in the number of repetition in the second set in all rest. *2-Independent Samples* test show that there is a difference in effect on the rest 2 minutes with 3 minutes and 2 minutes with 5 minutes, except at the rest 3 with 5 minutes. So, it can be concluded that there is an effect of the rest between sets of 2 minutes and 3 minutes on the number of repetition for bench press in women.

Key words: bench press, power method, rest, women

Abstract in Indonesia. Penelitian ini bertujuan untuk mengetahui pengaruh lama istirahat antar set terhadap jumlah repetisi angkatan *bench press* menggunakan metode power pada wanita. Metode yang digunakan adalah Poor Experimental dengan desain penelitian The One-Group Pretest-Posttest Design. Sampel dalam penelitian ini yaitu mahasiswi aktif Ilmu Keolahragaan FPOK UPI dengan jumlah sampel 10 orang. Teknik pengambilan sampel menggunakan purposive sampling. Instrumen yang digunakan berupa alat *free weight bench press* untuk menghitung jumlah repetisi angkatan. Hasil analisis data menunjukkan terdapat pengaruh dari istirahat terhadap penurunan jumlah repetisi, pada istirahat 2 menit dan 3 menit kecuali pada istirahat 5 menit. Hasil uji *K-Independent Samples*, menunjukkan terdapat perbedaan dari jumlah repetisi set ke-2 semua istirahat. Hasil uji *2-Independent Samples* menunjukkan terdapat perbedaan pengaruh pada istirahat 2 menit ketika dibandingkan dengan 3 menit, dan 2 menit ketika dibandingkan dengan 5 menit kecuali pada istirahat 3 menit ketika dibandingkan dengan 5 menit. Jadi dapat disimpulkan bahwa terdapat pengaruh dari istirahat antar set 2 menit dan 3 menit terhadap jumlah repetisi angkatan *bench press* pada wanita.

Kata Kunci: bench press, metode power, istirahat, wanita

How to Cite: Herdiansyah, R., Rusdiana, A., Badruzaman, B., Imanudin, I., Hamidi, A. (2022). The Effect of Rest Between Sets on The Repetition of a Women's Bench Press. *MIKI: Media Ilmu Keolahragaan Indonesia* 12 (1) July, 35-40.

DOI: <http://dx.doi.org/10.15294/miki.v12i1.29210>

INTRODUCTION

Weight training is an exercise that is carried out systematically using weights as a tool to increase the strength of muscle function in order to achieve goals such as improving physical condition, preventing injury or for health purposes (Dreger, Fitness, & Programs, nd). Weight training with external weights can basically be divided into two groups of exercises, the first is *free weight training* such as using dumbbells and barbells and the second is weight training using a *gym machine* (Calhoun & Fry, 1999).

In weight training, for example, in the form of bench press exercise, the benchmark for success in doing the bench press can be seen, one of which is

the number of repetitions or the number of lifts that can be done in each set. The number of repetitions or repetitions when doing the bench press can be influenced by several factors, such as physical condition, lifting load, and length of rest or rest (TO Bempa, 1996). In the bench press, the length of rest plays an important role in the number of lifts or repetitions, where the term rest is often used in the bench press. The purpose of the rest interval itself is the length of rest from one time to another, or in this case the length of rest time from one set to another. (Pekik, 2004, p. Panduan Latihan Kebugaran Jasmani.)

A study also showed that rest between sets can directly affect the repetitions completed during successive sets (Alles & Iranda, 2015). Therefore, there is a very close relationship between the rest period and the number of lifts or repetitions in the bench press. In addition, this rest is considered very important because it is related to the level of fitness in the next training period. Rest is also physically needed so that muscles can repair, rebuild, and make muscles stronger than before (Mahardhika, Karawang, & Exercise, 2018).

It should also be noted that the majority of previous studies examined the effect of rest on samples with male sex. On the other hand, there are still few studies examining the effect of rest on the female sex. However, this does not mean that there have not been any studies examining the effect of rest on samples with female sex. Like research from (Aigenbaum, Oss, & Ang, 2012), where the results of the study stated that women at all types of rest were actually able to do more repetitions in each set than men (Aigenbaum et al., 2012).

From the research above, it can be concluded that women are able to recover faster than men. This is in line with research (Judge & Burke, 2010) which states that women are able to recover faster from the bench press protocol compared to men. In addition, there are other studies which suggest that the reduction in fatigue caused by maximal strength is greater in men than in women (Hakkinen, 1993). These results are not without reason, this is due to several things such as: women are able to reduce ATP depletion, women have a faster rate of ATP recovery, and women have lower blood lactate levels, glycogen breakdown and epinephrine (Aigenbaum et al., 2012).

However, in fact there are still many questions related to the influence of strength and power on the repetition of forces in women. This is consistent with the research gap which suggests that further research is needed regarding the impact of absolute differences in muscle strength and power in response to rest manipulation (Aigenbaum et al., 2012). The definition of power itself according to (T. Bompa & Buzzichelli, 2015) is the ability of muscles in a very short time to produce maximum strength.

Research from (Richmond & Godard, 2003) states that future studies should be able to identify the impact of various things on rest periods in a set of different percentages of 1RM on each individual. The authors conclude that on the basis of considerations the heavier the load is given.

then the maximum power that must be issued. This is in accordance with the results of research stated by (Richard W. Bowers & Edward L. Fox, 1992) which states that muscle strength will be more effective when given a load slightly above its ability.

Then when we discuss the power method itself, according to (Suharjana FIK Uny, nd) exercise using the power method is at an intensity of 30% - 80% and rest between repetitions is around 3-15 seconds. In addition, according to (Dikdik Jafar Sidik, Paulus L. Pesurnay, nd) added that when practicing with the speed strength or power method, the resting parameters ranged from 2-6 minutes.

Therefore, the authors are interested in examining the effect of variations in the length of rest between sets including 2 minutes, 3 minutes and 5 minutes on the number of repetitions of the bench press force of 2 sets in every time off. In addition, the authors are also interested in using the power method at an intensity of 60% or equivalent to a load of 8 RM and make this a new study. In addition, as far as the author knows, there is no research using the power method at an intensity of 60% or the equivalent of 8 RM in female gender, making the authors more interested in applying the load using the power method which is then combined with predetermined breaks between sets. And make it as a new research that will be done.

METHODS

Research Problems, Methods, and Design

The method used in this research is an experimental research method with the research design of The One-Group Pretest-Posttest Design. This form of bench press exercise was chosen to standardize research and testing activities on the subject. In this study, the subjects were asked to perform 2 sets of bench presses with a rest between different sets in each testing session. Rest between sets of 2 minutes, 3 minutes, and 5 minutes is selected based on the previous reference. Then, the load or intensity used is 60% intensity or equivalent to 8RM load using the power method.

Subject

The subject is an active student of Sports Science, FPOK, Universitas Pendidikan Indonesia, totaling 10 people, all of whom are female. The method of taking subjects in this study used a purposive sampling method based on

inclusion requirements, namely in good health, , not suffering from musculoskeletal injuries, registered as an active student of Sports Science FPOK, Universitas Pendidikan Indonesia, female, able and having practiced weights, and willing to be a subject. study.

Initial Test

After arriving for initial testing, subjects were then asked to fill out *informed consent* as a form of willingness to be used as research samples. Subjects were then calculated their height and weight using a stature meter and electronic scales.

After a light warm-up using an ergo bicycle, the subjects then performed bench press lifts to find and determine their 1RM load. In short, the 1RM testing activity was carried out 2 times and was 3 minutes apart from the first experiment to the second experiment. This is done to validate the 1RM value so that there is no error in the 1RM value load obtained by each subject.

Before and during testing, all subjects were instructed to maintain activity levels, including following the same activity routines on the days prior to testing. Subjects were also instructed to refrain from taking the supplement until the final test session was over. In addition, all test sessions were conducted within 2 hours at the same time. To standardize the bench press technique, subjects were asked to use the same hand positioning for each trial. The right bench press technique, in particular, is to place the bench press bar until it touches the chest, and the hands are fully straight when pushing.

Treatment

Subjects started the study with a warm-up consisting of 5 minutes of low-resistance cycling using a bicycle ergometer and stretching of the

muscle groups involved. Within about 3 minutes after completing the warm-up, the subject then performed a bench press test using the power method at an intensity of 60% or the equivalent of 8RM with a calculated loading of a predetermined 1RM. After exhaustion, subjects were instructed to rest for 2, 3, or 5 minutes, during which time rest was randomly assigned to the subjects. During the rest period, subjects were instructed to minimize activity, with the only movements allowed being walking and light stretching. After a period of rest, the subject performed a second set using the same weight, then completed as many repetitions as possible until fatigue or reps began to slow down. Subjects performed the same protocol with rest time remaining for the next 2 test sessions. Sessions occur for at least 2 days, but no more than 5 days, for about 2 weeks after the initial testing session.

RESULTS AND DISCUSSION

All statistical analyzes were performed with the Statistical Package for the Social Sciences (SPSS, v.16.0; SPSS, Inc., Chicago, IL) and the level of significance was set at $p = 0.05$. The results of the analysis of the *2-Related Samples* (Wilcoxon) test showed that there was a significant effect of rest (2 minutes, $p 0.004$) and (3 minutes, $p 0.025$) on the number of repetitions of the *bench press force* in the 2nd set on each rest. Meanwhile, at 5 minutes of rest, although there was a decrease in average, overall, there was no significant effect of rest (5 minutes, 0.083) on the number of repetitions of the *bench press* in the 2nd set as shown in Figure 1.

Then, analysis using nonparametric test *K-Independent Samples* (Kruskal-Wallis) as shown in Table 2, the Sig value is obtained. (2-tailed) for

Table 1.

Sample	Weight (Kg)	Height (cm)	Force Load (Kg)
1	49.3	147	22.5
2	45.9	155	15
3	60.6	155	15
4	51.2	155.2	17.5
5	56	150.5	20
6	59.3	155	15
7	55.8	163.5	18
8	47.7	154	12.5
9	52.5	157.5	12.5
10	58	155	20

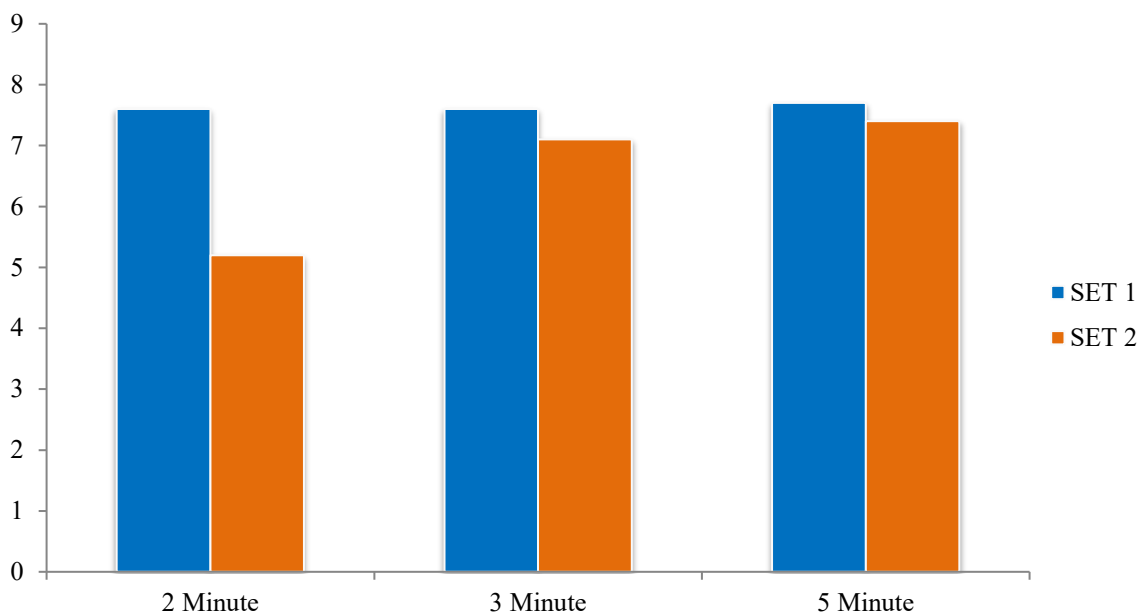


Figure 1. Data on the Number of Repetitions for Forces Set 1 and Set 2 at Every Break

Table 2. Kruskal Wallis Test

Statistics	Set 1	Set 2
Chi-Square	.278	21,378
df	2	2
asymp. Sig.	.870	.000

Table 3. 2-Independent Samples (Mann-Whitney)

Comparison of 2 minutes to 3 minutes	Set2	Comparison of 2 minutes to 5 minutes	Set2	Comparison of 3 minutes to 5 minutes	Set2
Mann-Whitney U	1.500	Mann-Whitney U	.000	Mann-Whitney U	37.000
Wilcoxon W	56.500	Wilcoxon W	55,000	Wilcoxon W	92.000
Z	-3.815	Z	-3.905	Z	-1.175
Comparison of 2 minutes to 3 minutes	Set2	Comparison of 2 minutes to 5 minutes	Set2	asympt. Sig. (2-tailed)	.240

the 2nd set of 0.00 which is this value < 0.05 . Therefore, it can be concluded that there is a significant difference in the number of reps in the 2nd set at all breaks. The next test can be seen in table 3, which is a different test with a non-parametric test, *2-Independent Samples* (Mann-Whitney) to determine the difference in the number of repetitions of the force in the 2nd set based on the number of repetitions of the force taken. From the test it can be concluded that there is a significant difference in the 2-minute inter-set rest when compared to the 3-minute and 5-minute inter-set rest ($p = 0.00$ in both comparisons of inter-set rest). However, there was no significant difference between resting between sets of 3

minutes when compared to resting between sets of 5 minutes ($p = 0.24$).

The main findings of this study were (a) there was a decrease in the mean number of repetitions of the lift in the 2nd set across all breaks between sets; (b) a range of 8-7 reps can be achieved and maintained by resting between sets of 3 and 5 minutes in both sets of rest between sets, but not with a rest of 2 minutes; (c) the total number of repetitions that can be done in the 2nd set at a 2-minute rest is less than the rest between sets of 3 and 5 minutes. From the research that has been done, it can be seen that, the largest decrease in the average number of repetitions of the bench press force in the 2nd set occurred at a 2-minute rest,

while the smallest decrease in the average number of repetitions of the bench press lift in the 2nd set occurred at rest. 5 minutes. This is not without reason; this decrease occurs because of the fatigue felt by the samples after loading in the previous set. The results of this study are similar to those of (Richmond & Godard, 2003) which stated that there was a significant reduction in the number of repetitions performed between the second set in all rest periods.

Another finding from this study is that there is a significant effect of resting 2 minutes and 3 minutes on the number of repetitions of bench press lifts in the 2nd set at each rest. While at the 5-minute break, although there was an average decrease, overall there was no significant effect of this 5-minute break on the number of repetitions of the bench press in the 2nd set. Apart from that, the results also showed that the second set with a 2 minute rest was significantly different from the second set with 3 and 5 minute rest periods. In addition, the 2-minute rest period did not provide an adequate amount of rest between sets in the sample. However, resting periods of 3 and 5 minutes between sets on the bench press allow for a level of recovery that is judged to be able to maintain the number of reps in the second set.

Then from the research that has been done, it can be concluded that a 2-minute rest period between sets cannot provide sufficient recovery to maintain repetitions in the 2nd set with a load of 8RM. While the recovery rate is sufficient to maintain repetitions in the 2nd set with a load of 8RM can be done with a rest period between sets of 3 and 5 minutes. However, 3 minutes of rest between sets is considered to be the most effective rest to maintain lifting reps in the 2nd set with a load of 8RM. Therefore, a 5 minute break between sets is not required and will exceed the recovery requirements when using an 8RM load.

It is not without reason that resting 5 minutes between sets is considered unnecessary as a rest time between sets when training weights in the form of bench press exercises at 8RM loads using the power method. This is related to the principle of overcompensation, where in general this overcompensation or overcompensation results from the match between the provision of rest time for the improvement of the organism with the exercise load process (TO Bompa, 1996). Therefore, this 3 minute rest period is considered to be in accordance with the 8RM loading on the power method so that it fulfills the concept of overcompensation itself. However, it is different from the 5 minute rest period between sets, in

which this 5 minute rest period is considered ineffective and tends to exceed the recovery requirements when using 8RM loads, and is considered to have passed the principle or overcompensation time.

For further research, it is hoped that the research method will be further improved, comparing the effect of resting between sets on the number of repetitions of the bench press force on the power training method with other weight training methods. Find out if the same rest can still apply if used on a training method other than the power training method.

CONCLUSION

Rest between sets of 3 minutes is the most effective rest to use when practicing bench press with the power method at a load intensity of 60% or 8 RM. Because the use of 1 minute rest is in fact unable to maintain the number of repetitions in the next set, in addition the use of 5 minutes of rest is considered excessive and does not comply with the rules of overcompensation.

REFERENCES

- Aigenbaum, A. V. D. F., Oss, R. Y. A. N. E. R., & Ang, J. I. E. K. (2012). *Terilabpps: tigm s*. 26(7), 1817–1826.
- Alles, S., & Iranda, H. U. M. (2015). *Terilrcpe dnm lbps*. 29(11), 3079–3083.
- Bompa, T., & Buzzichelli, C. (2015). *Periodization Training for Sports-3rd Edition*. Retrieved from <https://books.google.com/books?id=Zb7GoAEACAAJ&pgis=1>
- Bompa, T. O. (1996). Theory and Methodology of Training. In *Orietta Calcina*.
- Calhoon, G., & Fry, A. C. (1999). Injury Rates and Profiles of Elite Competitive Weightlifters. *Journal of Athletic Training*.
- Dikdik Jafar Sidik, Paulus L. Pesurnay, LA (nd). *There are several ways of training to increase power or speed strength, as follows: 1) Weight training using speed strength training parameters as follows*. Bandung: PT Pemuda Rosdakarya.
- Dreger, RW, Fitness, P., & Programs, T. (nd). Strength Training Considerations for Youth By. *Injury Prevention*, (780), 1–11.
- Hakkinen, K. (1993). Neuromuscular fatigue and recovery in male and female athletes during heavy resistance exercise. *International Journal of Sports Medicine*, 14(2), 53–59. <https://doi.org/10.1055/s-2007-1021146>

- Judge, L. W., & Burke, J. R. (2010). The effect of recovery time on strength performance following a high-intensity bench press workout in males and females. *International Journal of Sports Physiology and Performance*, 5(2), 184–196. <https://doi.org/10.1123/ijsp.5.2.184>
- Mahardhika, D. B., Karawang, U. S., & Latihan, P. M. (2018). *Rest and Recovery*. (November).
- Richmond, S. R., & Godard, M. P. (2003). the Effects of Varied Rest Periods Between Sets To Failure While Performing a Chest Press. *Medicine & Science in Sports & Exercise*, 35(Supplement 1), S371. <https://doi.org/10.1097/00005768-200305001-02060>
- Uny, S. F. I. K. (n.d.). *Metode melatih kekuatan*.



© 2022 by the authors. Submitted for possible open access publication under the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).