

BMSS6011

Evidence based practice

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**Variable
Resistance
Training in
strength
gain.**

Background Theory:

Variable resistance training is a strategic approach in strength training aimed at optimising muscle hypertrophy and performance.

This method involves adjusting resistance throughout the range of motion to match the muscle's strength curve, thereby ensuring maximal loading where muscles are biomechanically advantaged.

Key Concepts:

- Strength Curve Matching:
- Variable resistance training addresses the biomechanical principle of matching the strength curve, ensuring that resistance is applied in accordance with the muscle's varying force output capabilities (Loenneke et al., 2016).
- By providing maximal loading at all points in the range of motion, variable resistance training effectively targets muscles throughout their entire contractile capacity, overcoming sticking points and promoting balanced muscle development.

- Accommodating Resistance:
- The utilisation of resistance, most commonly resistance bands or chains, adjusts the resistance to the lifter's strength level, thereby increasing tension as the lifter exerts force (Suchomel et al., 2018).

Practical Application:

- Incorporate variable resistance training into muscle-building programs using various implements such as resistance bands, chains, or specialised machines.
- Tailor the resistance profile to match the strength curve of target muscles, focusing on optimising loading during both concentric and eccentric phases of movement.
- Gradually progress resistance levels over time to ensure continued adaptation and muscle growth.

Theory Conclusion:

- Variable resistance training offers a systematic approach to optimise muscle activation, promote balanced muscle development, and induce muscle hypertrophy.
- By aligning resistance with the muscle's strength curve, incorporating accommodating resistance, and prioritising muscle activation, variable resistance training can be an effective strategy for maximising muscle-building outcomes.



The study.

Aims and Objectives

The study aims to shed light on whether or not variable resistance training has an impact on strength gain over a 4 week block.

Testing Protocol / resistance band tension

To test the tension of the bands one band was placed on each side of a barbell, the barbell was then held by the participant at the bands most stretched position as the participants stood on the scales.

Therefore to calculate the bands resistance deduct the participants body weight and the 20kg barbell from the overall weight on the scales.

- red bands = 2.5kg each
- Black bands = 5kg each

Sessions

Session plan:

Bench Press:

Week 1:

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + red bands 2+ reps

Working sets 95% 1 rm + red bands 2+ reps

Back off sets 60% 1 rm + red bands 8+ reps

Week 2

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + purple bands 2+ reps

Working sets 95% 1 rm + purple bands 2+ reps

Back off sets 60% 1 rm + purple bands 8+ reps

Week 3

Re asses 1 rm

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + red bands 2+ reps

Working sets 95% 1 rm + red bands 2+ reps

Back off sets 60% 1 rm + red bands 8+ reps

Week 4

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + purple bands 2+ reps

Working sets 95% 1 rm + purple bands 2+ reps

Back off sets 60% 1 rm + purple bands 8+ reps

Week 5

Re asses 1 rm bench press

Session plan:

Squat:

Week 1:

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + red bands 2+ reps

Working sets 95% 1 rm + red bands 2+ reps

Back off sets 60% 1 rm + red bands 8+ reps |

Week 2

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + purple bands 2+ reps

Working sets 95% 1 rm + purple bands 2+ reps

Back off sets 60% 1 rm + purple bands 8+ reps

Week 3

Re asses 1 rm

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + red bands 2+ reps

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Week 4

(warm-up sets) 2 sets @ 50% 1 rm 15 reps

(Build up sets) 2 sets @ 75% 1 rm 8 reps

Working sets 80% 1 rm + purple bands 2+ reps

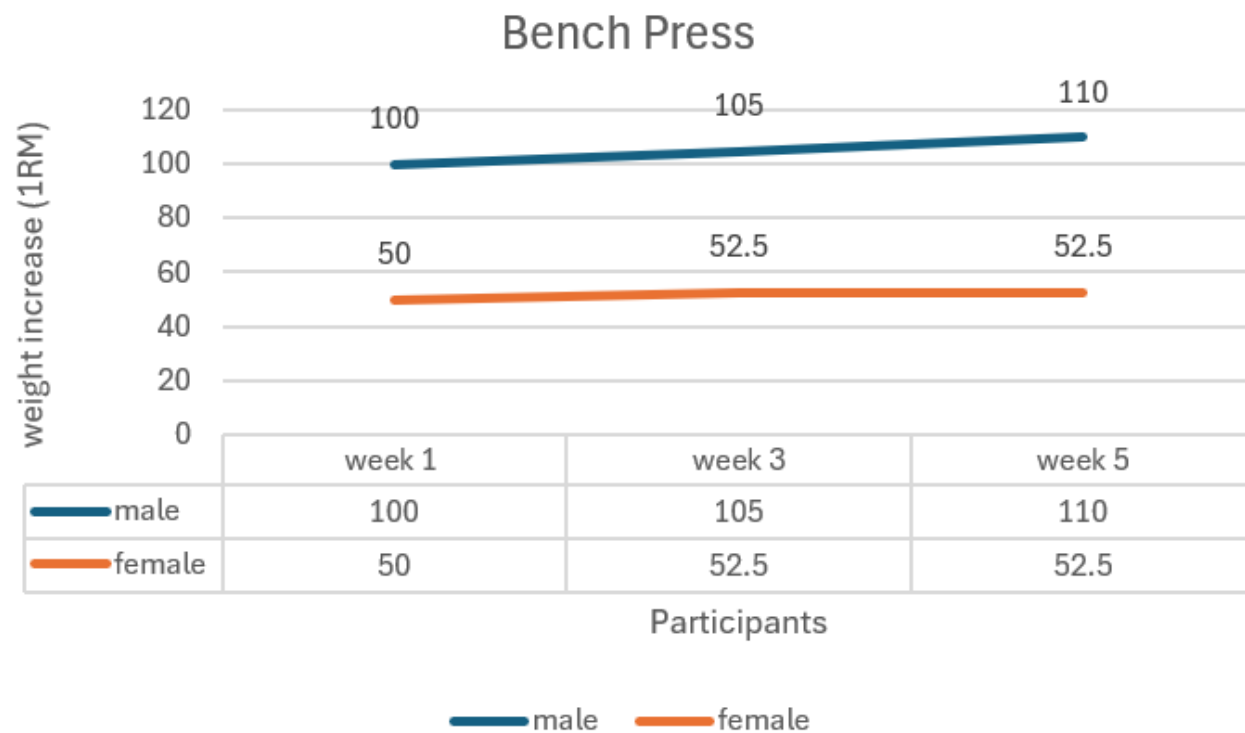
Working sets 95% 1 rm + purple bands 2+ reps

Back off sets 60% 1 rm + purple bands 8+ reps

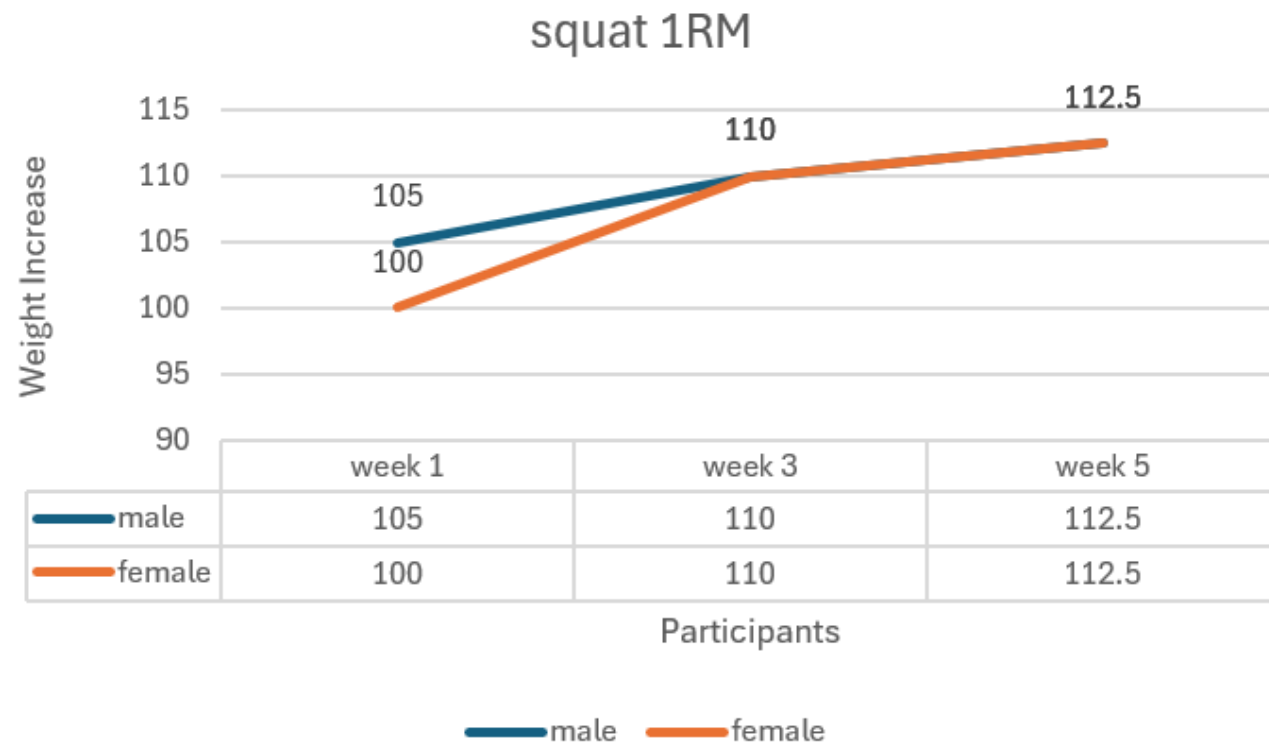
Week 5

Re asses 1 rm squat

Results (Bench Press)



Results (squat)



Discussion / Conclusion

- In conclusion, variable resistance training with resistance bands offers a comprehensive approach to enhance muscle activation, optimise strength curve alignment, and induce muscle hypertrophy. By providing accommodating resistance throughout the range of motion, resistance bands challenge muscles more effectively at the point of peak contraction, resulting in a more efficient and targeted workout compared to traditional free weights or machines.
- The study results further support the effectiveness of variable resistance training with resistance bands. Both male and female participants showed positive progressions in their 1-rep max (1RM) for bench press and squat exercises over the 5-week training period. The male participant increased his bench press by 10% and squat by 7.14%, while the female participant demonstrated a 5% increase in bench press and an impressive 12.5% increase in squat strength. These findings underscore the efficacy of variable resistance training in promoting muscle development and strength gains.

Reference list

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