Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XXV, ISSUE 2, 2025, Romania
The journal is indexed in: ERIH PLUS, Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XXV, ISSUE 2, 2025
June 2025, 25 (2): 207-211
Original article

THE EFFECT OF LOADED MOVEMENT TRAINING USING (VIPR) TUBE ON BONE MINERAL DENSITY AND DIGITAL LEVEL IN THE JAVELIN THROW COMPETITION

GEHAD MAHMOUD[1], MIHĂESCU ANDREEA[2]

Abstract

Aim. The (VIPR) Tube has become one of the most popular gym utensils due to its great versatility and effectiveness in increasing strength, endurance, agility, and balance. The aim of this study was to investigate the effectiveness of Loaded Movement Training Using (ViPR) Tube on Bone Mineral Density and Digital Level in the Javelin Throw Competition.

*Methods***.** The sample was chosen intentionally from the players of Mansoura University national team, numbering (11) players, and two players were excluded due to injury, so that the basic sample became (9) players, and (5) students from the Faculty of Physical Education, Mansoura University, who had numbers almost close to the digital level of the players of Mansoura University national team, were recruited to conduct the exploratory study on them.

Results. Statistical analyses showed that:

- Significant Difference between the Pre- Posttests for the experimental Group in all physical tests except (Leg muscle strength). The average rate ranged between 2.614% to 10.721%.
- No Significant Difference between the Pre- Posttests for the experimental Group in Digital Level of Javelin Throw. The average rate is 1.279%
- Significant Difference between the Posttests for the experimental and control groups in back BMD (L2-L4) and BMD. Femoral Neck of dominate leg. The average rate ranged between 14.534% to 17.433%.

Conclusions. According to the results of our article, eight weeks of Loaded Movement Training Using (ViPR) Tube could improve physical variables & Digital Level in the Javelin Throw Competition and bone density for athletics players.

Keywords: (VIPR) Training, Strength, Athletics.

Introduction

Scientific progress plays an important role in raising the level of skill performance in various sports. This is achieved by using advanced scientific methods in teaching and training to enhance the functional level of players, which in turn leads to an improvement in skill performance.

A player's skill level also largely depends on the conditions of their preparation and readiness to withstand the mental, physical, and psychological burdens associated with changing playing situations, ensuring that their athletic performance is as close as possible to ideal and with as little distraction as possible.

Amr Hamza, et al. (2015) indicate that most coaches use weight training only to improve their players' muscular strength. This is a common mistake in javelin throw training. Coaches should diversify their use of resistance training, ensuring that it is within the same motor pathway as the javelin throw. It is preferable to use medicine balls, dumbbells, and fiberglass.

Ahmed Sayed-Elahl, et al. (2022) points out that training with modern equipment and tools is a fundamental part of physical preparation. It has become a necessary requirement in various sports activities, whether individual or group. It is considered an effective method that has a positive impact on developing physical abilities specific to the type of activity being practiced.

Amr Hamza (2025) points out that ViPR (Virtual Tube) training is one of the newly used forms of training in the sports field. ViPR is an acronym for Vitality, Performance, and Reconditioning. Vitality refers to movement, while performance means performing at your maximum effort. Reconditioning is about strengthening—regenerating muscles for better performance.

Ahmed Sayed-Elahl, et al. (2022) points out that ViPR (Virtual Tube) training is one of the latest training trends. It was invented by Michol Dalcourt, a Canadian strength and conditioning coach, who wanted to create a method for developing fitness training by integrating strength training with functional movement, a term Dalcourt cites as "purposeful movement." Having worked with Canadian ice hockey teams, Dalcourt struggled to understand why players with farm backgrounds were always the strongest. He concluded that while other players might "lift" more weight in the gym during training, this "strength" didn't transfer to ice hockey during a game. His understanding was that "farm kids" had better transferable strength and that their strength was due to an integrated function resulting from "natural movements" lifting, pulling, bending, shoveling, pushing, pulling, lunging, etc. The function of integration through movement allows muscles

[1] Department of Physical Education and Movement Science, Faculty of Education, Qassim University, Saudi Arabia. Faculty of Physical Education, Mansoura University, Egypt; Corresponding author: amr297@aswu.edu.eg.
[2] Faculty of Physical Education and Sport, Ovidius University of Constanța, Romania.

to respond to the demands of ViPR by working in unison to overcome the momentum forces of acceleration and deceleration. Therefore, the demands on the underlying muscles are likely to be enormous, dependent on the weight of ViPR and the speed of movement. Nasser Abouzeid et al. (2025) points out that the ViPR differs from other tools such as kettlebells and medicine balls because of the length of the rubber tube. This increases the lever arm for the load, stabilizing the entire body against the tube load. Its shape, material, handles, and length also facilitate users' ability to perform a variety of movements that may not be possible with kettlebells or medicine balls.

He adds that ViPR exercises are performed using three motion patterns (transverse, horizontal, and sagittal), compared to other training methods, which are often performed using one or two axes, making them one of the most functionally effective tools.

ViPR stands for Vitality, Performance, and Reconditioning. It's a type of functional fitness training using a weighted rubber tube with handles. To ensure the effectiveness of any type or method of training, it must ensure maximum physiological benefit.

Amr hamza (2013) indicates that the ViPR has become one of the most popular gym utensils due to its great versatility and effectiveness in increasing strength, endurance, agility, and balance.

Sobhi Abdel Hamid (1996) asserts that athletic training leads to various physiological changes that affect virtually all body systems. The more positive these changes are, achieving the functional adaptation required to perform physical loads efficiently while minimizing energy consumption, the greater the improvement in performance. Therefore, track and field coaches must be familiar with the physiological aspects associated with athletic training, as the intensity of performance and physiological adaptation of athletes are assessed by continuously monitoring their physiological responses. One of the most important responses that track, and field coaches must consider is bone mineral density.

Bone Mineral Density (BMD) in Athletes is an important topic in sports sciences and health, as physical activity, especially weight-bearing and resistance exercises—significantly impact skeletal health. (Bakry Osama et al., 2022)

Ojanen et al. (2007), also confirms that high-concentration resistance training is an effectiveness to increasing bone mineral density, especially in the vertebrae. It also showed an increase in muscle endurance for these boys, which confirms that this increase in muscle strength and increase in bone mineral density and bone mass is a direct result of stimulating the nervous system, as well as increasing the rate of neuromuscular compatibility, which confirms the absence of a role for testosterone and androgen at this stage, which is the hormone Responsible for increasing strength and muscle mass.

Based on the above, this study was conducted with the aim of identifying the Effect of Loaded Movement Training Using (ViPR) Tube on Bone Mineral Density and Digital Level in the Javelin Throw Competition.

Methods

The sample was chosen intentionally from the players of Mansoura University national team, numbering (11) players, and two players were excluded due to injury, so that the basic sample became (9) players, and (5) students from the Faculty of Physical Education, Mansoura University, who had numbers almost close to the digital level of the players of Mansoura University national team, were recruited to conduct the exploratory study on them, and the researcher conducted homogeneity in height, weight and chronological age, and Table (1) shows that.

Tools and devices used

We used the following tools and devices to measure the research variables:

- Calibrated medical scale - for measuring body weight.
- Stadiometer device - to measure body weight and body height from the ground.
- ViPR (weighs 5, 7, 10 kg).
- Javelin Throw court.
- (DEXA) Dual X-ray energy Device, Norland brand (2010), in the Radiology Department of the Hospitals of the Faculty of Medicine, Mansoura University.

Physical tests

- Barbell Bench.
- Grip strength (left - right) using a grip dynamometer.
- Back muscle strength using a dynamometer.
- Leg muscle strength using a dynamometer.
- Standing broad jump test.
- 3 kg medicine ball throw test from a seated position.
- Spinal flexibility test.
- Core muscle strength.

Skillful test

- Digital Level of Javelin Throw.

Specifications of the training program

►program duration (8) weeks.

►weekly training units. (3) units

►Total (24) training session.

Statistical Treatments

We used the following statistical treatments by SPSS version 26:

- Mean, standard deviation, skewness, average rate, module, student T. test

Results

Table 1. Characteristics of groups (Mean ± SD)

Group	*N*	*Age [years]*	*Weight [kg]*	*Height [cm]*
Experimental	15	20.45 ± 1.32	69 ± 4.81	175 ± 2.71
skewness		0.874	0.054	0.772

Table 1 shows characteristics of group. There were no significant differences observed.

Table 2. Differences significant between the pretests and Posttests for the experimental Group in physical tests.

Variables	*Experimental group*		*Average rate%*	*Sign.*
	Before	*After*		
Barbell Bench	86.11 ±3.15	90.35 ±6.24*	4.924	S
Grip strength (right)	30.25 ±2.11	33.41 ±3.47*	10.446	S
Grip strength (left)	27.69 ±2.27	29.88 ±2.31*	7.909	S
Back muscle strength	87.80 ±3.25	91.74 ±4.41*	4.487	S
Leg muscle strength	90.29 ±3.17	92.65 ±3.80	2.614	NS
Standing broad jump	2.11 ±0.15	2.20 ±0.24*	4.265	S
3 kg medicine ball throw	12.34 ±1.11	12.92 ±1.30*	4.700	S
Spinal flexibility	26.21 ±1.14	29.02 ±1.22*	10.721	S

Table 2 shows that:

- Significant Difference between the Pre- Posttests for the experimental Group in all physical tests except (Leg muscle strength).
- The average rate ranged between 2.614% to 10.721%.

Table 3. Differences significant between the Posttests for the experimental and control Groups in Skillful tests.

Variables	*Experimental group*		*Average rate%*	*Sign.*
	Before	*After*		
Digital Level of Javelin Throw	44.57 ±1.75	45.14 ±1.47*	1.279	NS

Table 3 shows that:

- No Significant Difference between the Pre- Posttests for the experimental Group in Digital Level of Javelin Throw.
- The average rate is 1.279%

Table 4. Differences significant between the Posttests for the experimental and control Groups in bone mineral density for back and dominate leg.

Variables	*Experimental group*		*Average rate%*	*Sign.*
	Before	*After*		
BMD (L2-L4)	1.149 ±0.06	1.316 ±0.04*	14.534	S
BMD. F. N	1.239 ±0.03	1.455 ±0.08*	17.433	S

Table 4 shows that:

- Significant Difference between the Posttests for the experimental and control groups in back BMD (L2-L4) and BMD. Femoral Neck of dominate leg.
- The average rate ranged between 14.534% to 17.433%.

Discussions

We attribute these changes to the careful planning of the portable movement training program using the ViPR rubber tube and the scientific rationing of training loads appropriate to the sample, with the goal of developing muscular endurance. We considered training with gradual loads during the program's implementation, training different muscle groups, particularly the core, arms, and legs. We focused on the muscle groups working in the javelin throw competition and carefully selected ViPR rubber tube exercises, which led to improved physical variables under study.

Iqbal Kamel (2004) confirms that track and field competitions are considered sports that rely on numerical achievement. To achieve this in a positive manner, modern and advanced sports equipment must be used to achieve improved records.

Ahmed Sayed-Elahl, et al. (2022) confirms that auxiliary tools and devices are important and effective in positively influencing training and improving its execution, as they stimulate the players' activity and enthusiasm. In this regard, Fabio Comana (2004) emphasizes that one of the most important features of ViPR training is its emphasis on the core, where strong core muscles connect the lower limb to the upper limb. Furthermore, it includes multi-directional movements, making it one of the best exercises used to improve muscular endurance. Regarding improving muscular endurance, Bakry Osama et al. (2022) emphasize that the activity of the elastic reflex allows for excellent transfer of muscular endurance to similar biomechanically similar movements that require high endurance from the trunk and legs, with results evident in the performance of the broad jump. The results of the study are consistent with the results of Abdel Rahman Rushwan (2021), Osama Tamam (2022), Shady Muhammad (2022) in that training on portable movement using the rubber tube (ViPR) contributes to improving physical variables.

We believe that the relationship between the skill performance of the javelin throw competition, and its various physical requirements (generally and specific) is a close one that must be considered when preparing players. There should be no separation between skill and physical preparation. On the contrary, the physical components must be developed in accordance with the competition's requirements. Therefore, the physical components are considered among the most important performance requirements in field competitions in general and the javelin throw competition in particular.

This is consistent with the opinion of Marwan Ali (2003) regarding the necessity of matching the prevailing muscle contractions of the selected specific exercises as closely as possible to those occurring during the performance of the skill itself, both in terms of the type of these contractions and their degree of intensity. Muhammad Al-Diyasti (2015) believes that the use of modern devices and tools is the most important method or alternative for increasing the effectiveness of the training process, which contributes to addressing some deficiencies. During interim training, those responsible may neglect to consider the balanced development of the working and opposing muscles. This is consistent with what Amr Hamza, et al. (2015) concluded, which is that skill training alone is not sufficient to improve that skill and achieve fruitful results. In addition to developing the skill, the motor abilities specific to the skill itself must also be developed.

We attributed this to the fact that exercise in general leads to maintaining the level of bone mineral density. This is consistent with the findings of Calbet et al. (2001) that prolonged practice can cause an increase in BMD of the femoral neck and spine. It also agrees with Amr Hamza, et al. (2015) that physical activity and health nutrition could increase BMD.

Conclusions

According to the results of our article, eight weeks of Loaded Movement Training Using (ViPR) Tube could improve physical variables & Digital Level in the Javelin Throw Competition and bone density for athletics players.

References

Abdel Rahman Rashwan. (2021). The effect of vipr training on specific physical abilities and performance level of arm grip and upper back throwing skills among junior wrestlers in assiut governorate. *Master's Thesis*, Assiut University - Faculty of Physical Education.

Ahmed, S. E., Melenco, I., Mihai, A. D., Osama, B., Amr, Hamza. (2022). Effect of kettlebell training on bone mineral density and certain skillful variables for young soccer players. *Ovidius University Annals, Series Physical Education and Sport / Science, movement and health*. Vol. XXII, Issue 1.

Amr Hamza & Ashraf Mostafa Abdelrhman Madny. (2015). Effects of Ai Chi exercises on bone mineral density and certain physical variables for postmenopausal women. *Sports Science and Neuroscience International Conference*, Germany.

Amr Hamza. (2013). Effects of circular strength training system on bone mineral density and kicks performance for young soccer players. O*vidius University Annals, Series Physical Education and Sport / Science, Movement and Health*. (13). 2 Supplement. 137-144.

Amr Hamza. (2025). *Functional Training for Athletes (Fashion Training).* Dar Al Fikr Al Arabi, Cairo.

Bakry Osama, Elhabashy Ahmed, Cazan Florin, Dragomir Lenuța, Amr Hamza. (2022). Effect of flywheel resistance exercises on oxidative stress and record level of 100m backstroke for young swimmers. *Ovidius University Annals, Series Physical Education and Sport / Science, movement and health.* Vol. XXII, Issue 1, Romania.

Calbet. J.A., Dorado, D., Herrera, P., Rodrigvez Rodrigvez, L.D, (2001). Density in male Football (Soccer) Players, *Medsci sports Ercis Jurnal*. 3 pp. (1682-7), U.S.A.

Fabio Comana. (2004). *Function training for sports*. Human Kinetics: Champaign IL, England

Iqbal Kamel. (2004). *Track and field competitions: theoretical foundations and applied skills*. Kitab Publishing Center.

Marwan Ali. (2003). The effect of weightlifting and plyometric training on some physical, skill, and physiological variables of handball players. *PhD Thesis*, Faculty of Physical Education, Minya University.

Muhammad Al-Diyasti. (2015). The effect of special coordination abilities training on some kinematic variables influencing the level of digital achievement of junior javelin throwers. *Scientific Journal, Faculty of Physical Education, Alexandria University*.

Nasser Abouzeid, Mohamed Saad, Bogdan-Constantin Ungurean, Alin Larion, Adam Zajac, Walaa Kobacy, Usama Elgazzar, Gehad Mahmoud, Hachim Shani, Hatem Ibadi, Amr Hamza. (2025). The effects of moringa seed supplements on oxidative stress and 10 km running performance. *Journal of Human Sport and Exercise*. 20 (3). Pp.1012-1019.

Ojanen, T., Rauhala, T., Häkkinen, K. (2007). Strength and power profiles of the lower and upper extremities in master throwers at different ages. *J Strength Cond Res*. 21(1):216-22.

Osama Tamam. (2022). The effect of vipr training on specific physical abilities and performance level of firefighter skills among junior wrestlers in assiut governorate. *Journal of Sports Sciences*. Vol. (35), Part (8), Faculty of Physical Education, Minya University.

Shady Mohamed. (2022). Evaluation of a training program using trx & vipr training and its effect on the performance level of some tennis skills. *PhD Thesis*, Sadat City University - Faculty of Physical Education, Sadat City.

Sobhi Abdel Hamid. (1996). *Physiology of Sports Training*, Bayansia Printing House, Zagazig.