The One-On-One Column provides scientifically supported, practical information for personal trainers who work with apparently healthy individuals or medically-cleared special populations.

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Applications of Kettlebells in Exercise Program Design

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SUMMARY

THE PURPOSE OF THIS COLUMN IS TO PROVIDE BASIC RECOMMENDATIONS FOR PERSONAL TRAINERS AND STRENGTH COACHES ON HOW TO INTEGRATE KETTLEBELL TRAINING INTO THEIR CLIENTS' EXERCISE PROGRAMS. THIS COLUMN REVIEWS THE CURRENT LITERATURE ON KETTLEBELL TRAINING AND EXAMINES POTENTIAL BENEFITS FOR STRENGTH, POWER, MUSCULAR ENDURANCE, AND FAT LOSS. RECOMMENDATIONS ARE PROVIDED AS TO HOW KETTLEBELLS CAN BE EFFECTIVELY INTEGRATED INTO EXERCISE PROGRAM DESIGN. TECHNIQUE FOR PROPER AND SAFE PERFORMANCE OF SOME OF THE BASIC KETTLEBELL EXERCISES IS ADDRESSED.

Today's strength coaches and personal trainers have a wide variety of modalities at their disposal to help their athletes and clients achieve desired results. Resistance training can be performed with many different modalities, including free weights, machines, resistance tubing, medicine balls, and bodyweight. All these modalities possess certain advantages and disadvantages with respect to achieving an adaptive response. The kettlebell is no different. Their use dates back hundreds of years when they were a popular training implement in various Eastern Block countries for increasing strength, endurance, agility, and balance, as well as challenging both the muscular and the cardiorespiratory systems.

The majority of kettlebell exercises focus on dynamic, total body integration movements rather than muscular or joint isolation. In recent years, the kettlebell has risen in popularity throughout the world. However, there has been limited empirical evidence to support kettlebell use as a training modality. Moreover, because many kettlebell exercises are ballistic in nature, the question arises as to whether or not kettlebell training is effective for increasing muscular strength, muscular endurance, cardiorespiratory endurance, and decreasing body fat.

RESEARCH

Aside from safety, a primary concern of the strength coach or personal trainer should be whether a modality such as the kettlebell has any merit in helping their athletes or clients achieve their training goals. Although there has been a paucity of research to date, several recent studies do suggest a potential role for the use of kettlebells in strength and conditioning protocols.

A search of PubMed revealed just 1 study that directly investigated the effects of kettlebells on muscular strength, power, and endurance. Manocchia et al. (3) recruited 15 subjects (20–72 years of age) with varying levels of exercise experience and evaluated their response to a regimented kettlebell training program. After 10 weeks of biweekly training, significant improvements were seen in bench press strength (51.7 ± 25.0 kg versus 56.4 ± 27.1 kg) and back extension endurance (45 ± 5.7 repetitions versus 54 ± 9.3 repetitions). Moreover, a high degree of transfer was noted in performance of the traditional clean and jerk (30.8 ± 16.7 kg

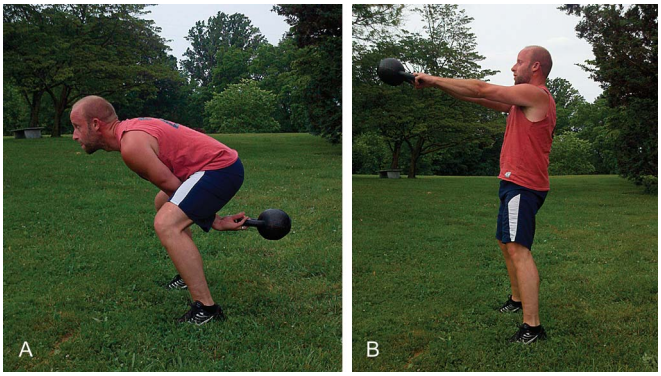

Figure 1. Two-arm kettlebell swings: backward (a) and forward (b) positions.

versus 38.5 ± 17.1 kg), indicating that kettlebell training significantly enhances muscular power. Taken as a whole, these results suggest that kettlebells are effective for improving varying components of muscular fitness and are suitable to a wide range of training abilities and demographic groups.

Kettlebells also may be beneficial for improving cardiorespiratory fitness and aiding in weight management. A study by Farrar et al. (1) determined that the heart rate response and oxygen cost of performing the kettlebell swing (Figures 1a and 1b) had a greater impact to the cardiorespiratory system than has been shown with the traditional circuit weight training. Other research suggests that kettlebell training may not be quite so metabolically demanding. Preliminary research by Lanier et al. (2) estimated that the energy cost of kettlebell exercise equates to 4.97 ± 2.02 kcal/min. This is significantly less than barbell training, which has been shown to result in an expenditure of 11.5 kcal/min (4). It should be noted that the training

Table 1
Kettlebell exercises

Exercise	Movement
1- or 2-arm swing (2 arm pictured in Figures 1a and 1b)	• The kettlebell swing is essentially a ballistic deadlift.
	• Start swing from floor slightly in front of you.
	• Let kettlebell swing back as far as possible, as if hiking a football.
	• Explosively extend knees and hips while swinging kettlebell to shoulder/chest level.
	• Let kettlebell swing back into the "hike" position again (without returning to the floor) and repeat.
	• The kettlebell should not travel below the knees at any point during the swing.
1- or 2-arm clean and press (1 arm pictured in Figures 2a–c)	• The clean is essentially a swing that ends in the rack position. Begin the same way the swing begins. The thumb portion of the hand should point towards the body.
	• Instead of swinging the kettlebell out in front with a straight arm, keep the elbow tight to the ribs and pull the kettlebell up the front of the body as if zipping up a jacket. Finish in the rack position. The kettlebell should "wrap" around the arm instead of banging the forearm.
	• Squat slightly and jerk the kettlebell overhead.
	• Let the kettlebell "fall" through the press back down to the rack position and "catch" the bell by quickly bending the knees and then return to standing.
	• Throw the kettlebell back into the "hike" position of the swing and repeat.
Goblet squat (2 arm pictured in Figures 3a and 3b)	• Stand with feet shoulder width apart and hold kettlebell by the horns so elbows are at ribs. The handle of the kettlebell should sit at around the chest level. You may hold the kettlebell with the bell down or "bottoms up" style.
	• Squat down as low as possible while maintaining a neutral spine.
	• Forcefully rise out of the bottom position back to the start position.
	• If necessary, use a Valsalva maneuver to push through the sticking point.

Figure 2. One-arm clean and press: (a) clean with thumb portion pointing towards the body, (b) rack with kettle bell wrapping around the arm press, (c) overhead pressing of the kettlebell.

intensity used to determine kettlebell energy expenditure was substantially lower than that used for the barbell protocol. Thus, comparisons between the 2 modalities are difficult to interpret and would seem to be related to the greater training loads employed in barbell exercises. Further research is warranted in this area.

Taken as a whole, current evidence seems to indicate that kettlebells have efficacy as a training implement. At the very least, their use helps to interject greater exercise variety into a routine. This can be beneficial in optimizing muscle development (5) and enhancing exercise motivation (6).

IMPLEMENTATION

When implemented properly, kettlebells can be used as an alternative for training movements, such as the squat, deadlift, or clean. Setting up the proper prescription for overload and progression should be the primary goal when introducing kettlebells into a training program. Training protocols for kettlebells do not necessarily need to be different from the traditional resistance training protocols; they are simply the means of the external resistance. Moreover, the concept of specificity should be considered when designing a kettlebell program (e.g., client is not entering a Strongman contest).

As with any training implement, the amount of resistance chosen depends entirely on the strength and skill level of the individual for the particular exercise in question. As a general rule, female rank beginners will start with approximately 8–12 kg for double-handed swings, whereas male rank beginners will start around 12–16 kg. These loads should be adjusted accordingly, depending on the client. Emphasis should be placed on the safety and technique of the movements. Because most kettlebell exercises are compound movements, specific emphasis should be placed on the explosive triple extension at the ankle, knee, and hip joint complexes when performing these exercises. See Table 1 for descriptions and muscles used with some common kettlebell exercises.

Figure 3. Goblet squat: (a) start position and (b) end position.

CONCLUSIONS

Kettlebells can be a safe and effective exercise modality that enhances a client's training experience. Used properly, kettlebells can help to accelerate fat loss and develop muscular strength, muscular endurance, and cardiorespiratory endurance. Numerous certifying bodies exist that teach proper kettlebell technique, including the Russian Kettlebell Challenge and International Kettlebell and Fitness Federation. It is recommended that the strength coach or trainer consult with one of these organizations for more information on implementing kettlebells into their training programs.

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